

# JVC

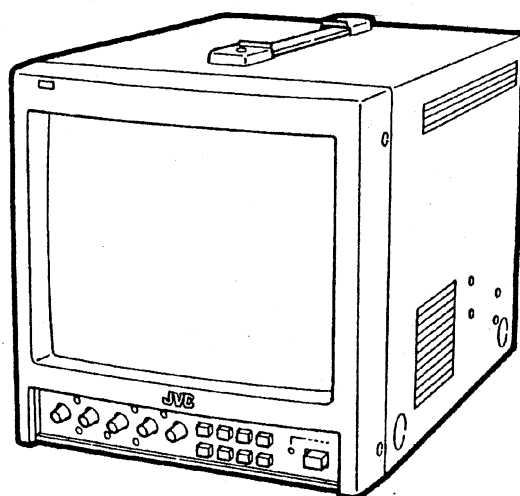
## SERVICE MANUAL

### COLOUR VIDEO MONITOR

# TM-1010PN

BASIC CHASSIS

B10



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CHANGED PARTS LIST

⚠	Ref No.	Parts No.		Parts Name	Remarks
		TM-1010PN	TM-1010PN/A		
● EXPLODED VIEW PART LIST (Page 21)					
⚠	32	CM22867-A27(R)	LC20405-006A-0L	Roll R Label	
● PACKING PART LIST (Page 31)					
	1	CP11224-A40	LC10453-048A-H	Packing Case	
	11	CM47385-00A	CM47385-00B-H	Pos/serial Label	



VICTOR COMPANY OF JAPAN, LIMITED  
TELEVISION RECEIVER DIVISION 1106 Heta, Iwai-city, Ibaraki-prefecture, 306-0698, Japan



# OPERATING INSTRUCTIONS (TM-1010PN / TM-1010PN-K)

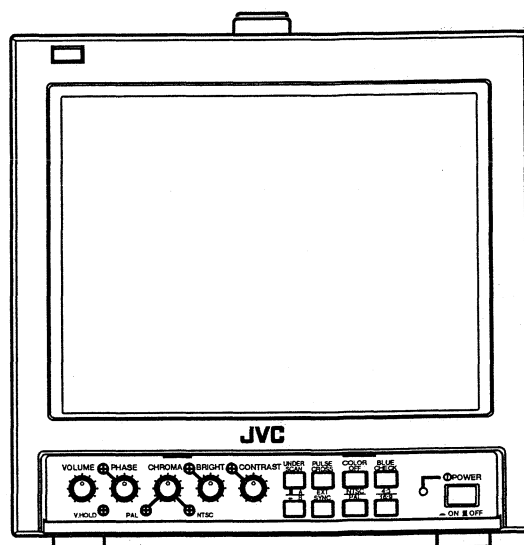
# JVC

COLOUR VIDEO MONITOR

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## TM-1010PN TM-1010PN-K

## INSTRUCTIONS



Thank you for purchasing this JVC colour video monitor. Before using it, read and follow all instructions carefully to take full advantage of the monitor's capabilities.

## SAFETY PRECAUTIONS

In order to prevent any fatal accidents caused by misoperation or mishandling of the monitor, be fully aware of all the following precautions.

### WARNINGS

To prevent fire or shock hazard, do not expose this monitor to rain or moisture.  
Dangerous high voltages are present inside the unit.  
Do not remove the back cover of the cabinet.  
When servicing the monitor, contact qualified service personnel. Never try to service it yourself.

**WARNING : THIS APPARATUS MUST BE EARTHED.**

Machine Noise Information Ordinance 3, GSGV, January 18, 1991: The sound pressure level at the operator position is equal or less than 70 dB (A) according to ISO 7779.

Improper operations, in particular alteration of high voltage or changing the type of tube may result in x-ray emission of considerable dose. A unit altered in such a way no longer meets the standards of certification, and must therefore no longer be operated.

### PRECAUTIONS

- Use only the power source specified on the unit.
- When not using this unit for a long period of time, or when cleaning it, be sure to disconnect the power plug from the AC outlet (or DC power plug from the DC battery).
- Do not allow anything to rest on the power cord.  
And do not place this unit where people will tread on the cord.
- Do not overload wall outlets or power cords as this can result in a fire or electric shock.
- Avoid using this unit under the following conditions:
  - in extremely hot, cold or humid places,
  - in dusty places,
  - near appliances generating strong magnetic fields,
  - in places subject to direct sunlight,
  - in badly ventilated places,
  - in automobiles with doors closed.
- Do not cover the ventilation slots while in operation as this could obstruct the required ventilation flow.
- When dust accumulates on the screen surface, clean it with a soft cloth.
- Unplug this unit from the AC outlet (or DC power plug from the DC battery) and refer servicing to qualified service personnel under the following conditions:

### SCREEN BURN

- It is not recommended to keep a certain still image displayed on screen for a long time as well as displaying extremely bright images on screen. This may cause a burning (sticking) phenomenon on the screen of cathode-ray tube. This problem does not occur as far as displaying normal video playback motion images.

## POWER CONNECTION for TM-1010PN-K (U.K. only)

\* The TM-1010PN-K power cord (for the United Kingdom) has a fuse built into the plug connecting to the AC outlet.

### WARNING

**DO NOT cut off the mains plug from this equipment.**  
If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or adaptor or consult your dealer.

The wire which is coloured green-and-yellow must be connected to the terminal which is marked with the letter E or the safety earth symbol  $\oplus$  or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

When replacing the fuse, be sure to use only a correctly rated approved type, re-fit the fuse cover.

**WARNING:**

**THIS APPARATUS MUST BE EARTHED.**

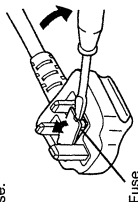
### IMPORTANT.

The wires in the mains lead on this product are coloured in accordance with the following code:

Green-and-yellow : Earth  
Blue : Neutral  
Brown : Live

As these colours may not correspond with the coloured marking identifying the terminals in your plug, proceed as follows:

**How To Replace The Fuse**  
Open the fuse compartment with the blade screwdriver, and replace the fuse.



## CONTENTS

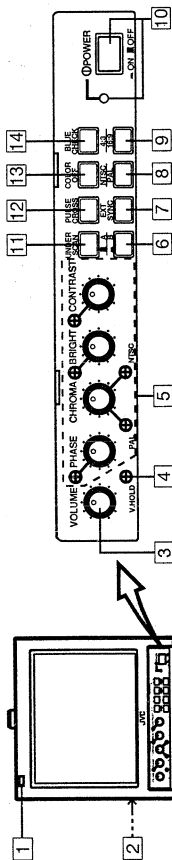
<b>SAFETY PRECAUTIONS</b> .....	<b>2</b>
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# I CONTROLS AND FEATURES

## Front

<Front Panel>



### 1 Tally lamp

Indicates that a control signal is being received. The tally lamp functions when the control signal is input to the TALLY/REMOTE terminal on the rear panel.

### 2 Speaker

A built-in speaker is located inside the left side panel.

### 3 VOLUME control

Adjusts the speaker volume.

### 4 V.HOLD control

Use a small-bladed screwdriver to adjust the image's vertical stability.

### 5 Picture control section

PHASE, CHROMA, BRIGHT and CONTRAST controls are available.

The standard setting mode can be obtained by setting each control to the center click position. To adjust a setting, insert a small-bladed screwdriver into the space around the knob and turn it to the desired position. When adjusting, use the small-bladed screwdriver and insert it into the control hole around the required control knob.

#### ■ PHASE control

Adjusts picture hue.

#### ■ CHROMA control

Adjusts picture colour density.

#### ■ BRIGHT control

Adjusts picture brightness.

#### ■ CONTRAST control

Adjusts picture contrast.

### Notes:

• The PHASE control is effective only in the NTSC colour system mode.

• The standard CHROMA setting can be adjusted to suit the NTSC or PAL colour system.

### 6 VIDEO A/B switch

Selects the video signal input to the video input terminals on the rear panel.

A (■) : Selects the video signal input to VIDEO A terminal.

B (■) : Selects the video signal input to VIDEO B terminal.

### Note:

• VIDEO B terminals include both Y/C (S-Video) and composite VIDEO terminals. Y/C inputs have priority.

### 7 EXT SYNC switch

Selects internal sync or external sync.

When using with the external sync, input the sync signal to the EXT SYNC terminal on the rear panel.

(■) : Internal sync

(■) : External sync

### 8 NTSC/PAL switch

Selects the NTSC or PAL colour system.

NTSC (■) : For NTSC colour system.

PAL (■) : For PAL colour system.

### 9 4 : 3/16 : 9 switch

Selects the aspect ratio (4:3 or 16:9) of the picture displayed on the screen.

(■) : 4 : 3

(■) : 16 : 9

### Note:

• When a 4:3 picture is viewed in the 16:9 mode, the size of the image is reduced vertically.

### 10 POWER switch/POWER indicator

Press this switch to turn the power on or off.

ON (■) : Power is turned on and the power indicator lights.

OFF (■) : Power is turned off and the power indicator goes off.

### Note:

• If the battery expires while the monitor is operated with DC power supply (the voltage level drops), the green indicator changes to orange, then to red. When the POWER indicator changes to red, the power automatically goes off. Make sure you switch off the power before replacing the battery.

### 11 UNDER SCAN switch

Selects the scanning mode (over scan screen or under scan screen).

(■) : Over scan screen

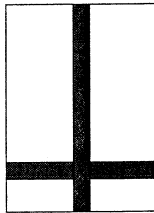
(■) : Under scan screen

### 12 PULSE CROSS switch

Checks the retrace period (sync signal) by delaying the input signal.

(■) : Normal screen

(■) : Retrace period display screen



### 13 COLOR OFF (colour off) switch

Selects the screen mode (colour or BW). Useful when you want to check the white balance.

(■) : Colour screen

(■) : BW screen

### 14 BLUE CHECK switch

Selects the screen mode (normal or monochrome blue screen). Useful when you want to check the chroma and phase adjustment.

(■) : Normal screen

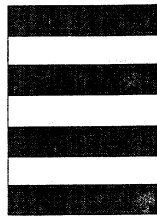
(■) : Monochrome blue screen

### Note:

• The PHASE adjustment is effective only in the NTSC colour system mode.

### How to adjust

1. Select the monochrome blue screen mode and input colour bar signals in the order of brightness.
2. Adjust the CHROMA and PHASE controls until the density and brightness of each blue bar are the same.



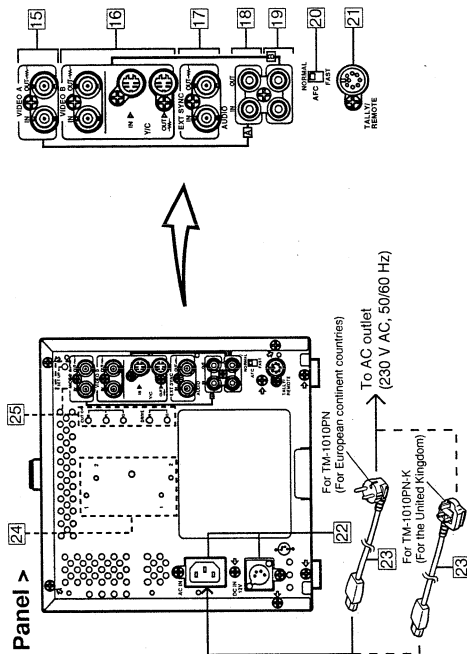
Adjust the blue bars to the same density and brightness.

(continued on the next page →)

# I CONTROLS AND FEATURES (cont'd)

## Rear

< Rear Panel >



### [15] VIDEO A terminals

Video signal input (IN) and output (OUT) terminals.  
The output terminal is bridge-connected.  
IN : Video signal input terminal  
OUT : Bridge-connected video signal output terminal

#### Notes:

- \* For corresponding audio signals, use the AUDIO A terminals [18].
- \* Also refer to the Basic Connection Example on page 8.

### [16] VIDEO B terminals

Video signal input (IN) and output (OUT) terminals for both composite and Y/C-separated (S-Video) terminals. Each output terminal is bridge-connected.

[BNC terminals]

IN : Video signal input terminal  
OUT : Bridge-connected video signal output terminal  
[Y/C (mini-DIN 4-pin) terminals]  
IN : Y/C-separated (S-Video) signal input terminal  
OUT : Bridge-connected Y/C signal output terminal

#### Notes:

- \* For corresponding audio signals, use the AUDIO B terminals [19].
- \* Y/C- terminal has priority.
- \* Also refer to the Basic Connection Example on page 8.

### ■ Y/C terminal pin layout

Pin No.	Signal
1	GND (Y)
2	GND (C)
3	Y
4	C

### [17] EXT SYNC terminals

External sync signal input (IN) and output (OUT) terminals.  
The output terminal is bridge-connected.  
IN : Input terminal for the external sync signal  
OUT : Bridge-connected output terminal

#### Notes:

- \* Also refer to the Basic Connection Example on page 8.

### [18] AUDIO A terminals

Input (IN) and output (OUT) terminals for the audio signal corresponding to the VIDEO A terminals [15].  
The output terminal is bridge-connected.  
IN : Audio input terminal  
OUT : Bridge-connected output terminal

#### Notes:

- \* For corresponding video signals, use the VIDEO A terminals [15].

### [19] AUDIO B terminals

Input (IN) and output (OUT) terminals for the audio signal corresponding to the VIDEO B terminals [16].  
The output terminal is bridge-connected.  
IN : Audio input terminal  
OUT : Bridge-connected output terminal

#### Notes:

- \* For corresponding video signals, use the VIDEO B terminals [16].

### [20] AFC switch

Selects the AFC (Automatic Frequency Control) time constant for the horizontal sync circuit.  
Correct the skewed portion of the picture.  
**NORM position** : Normal mode  
**FAST position** : Fast mode (fast: smaller time constant)

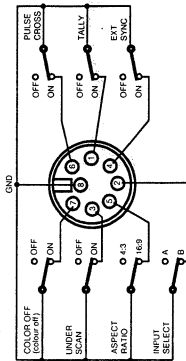
### [21] TALLY/REMOTE terminal

External control terminal (DIN 8-pin). Tally lamp, VIDEO A/B (input selection), Under Scan, External Sync, 4:3/16:9 (aspect ratio), Pulse Cross, and Colour Off modes can be controlled from an external unit.

#### Note:

- \* When you're controlling the monitor externally via the TALLY/REMOTE terminal, set all corresponding switches on the front panel to the OFF (■) position. (Which switch is pressed first has priority so remote switches may not function if the panel switches are ON (▲) position.)

### ■ TALLY/REMOTE terminal pin layout



### [22] Power input connector

Supply power to either the AC IN or DC IN 12 V connector.

#### [AC IN]

Connect the provided AC power cord between the AC IN connector and an AC outlet (230 V AC, 50/60 Hz).

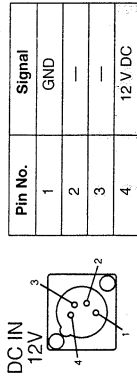
#### [DC IN 12V]

Connect the 12 V DC power plug to the DC IN 12V connector.

#### Notes:

- \* AC IN connector can function between 100 and 230 V AC, 50/60 Hz.
- \* See your dealer for more information on 12 V DC power supply.
- \* When both AC IN and DC IN connectors are used, the AC input has priority.
- \* The DC power supply does not automatically take over if an AC outlet is unplugged or the AC power is cut off when both AC and DC power supplies are connected. In this case, press the POWER switch to set to OFF, then press it again to turn the power ON.

### ■ DC IN 12V connector pin layout



### [23] Power cord

Connect the provided power cord (230 V AC, 50/60 Hz) to the AC IN connector.

#### Notes:

- \* The TM-1010PN power cord is for use in European continent countries.
- \* The TM-1010PN-K power cord is for use in the United Kingdom only. (The power cord for the United Kingdom has a fuse built into the plug to the AC outlet.)

### [24] External battery mounting holes

Attach an external battery to either pair of holes (1 or 2) to use 12 V DC power (depending on the type of battery).

#### Notes:

- \* External batteries manufactured by PAG or Anton Bauer are available.
- \* See your dealer for details.

### [25] Switch/control adjustment holes for service personnel

For adjustment of SET UP switch, CUT OFF (B, R, G) control and DRIVE (R, G) control during servicing.

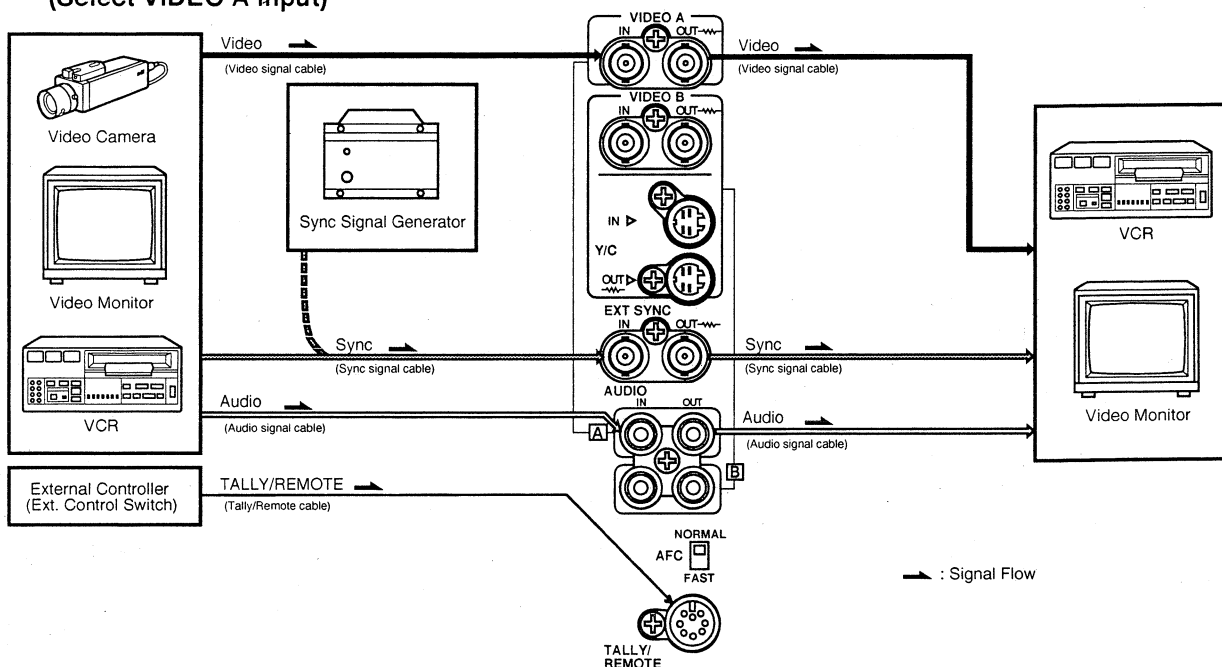
#### Note:

- \* These controls are exclusively for the use of service personnel. Do not attempt to adjust them yourself.

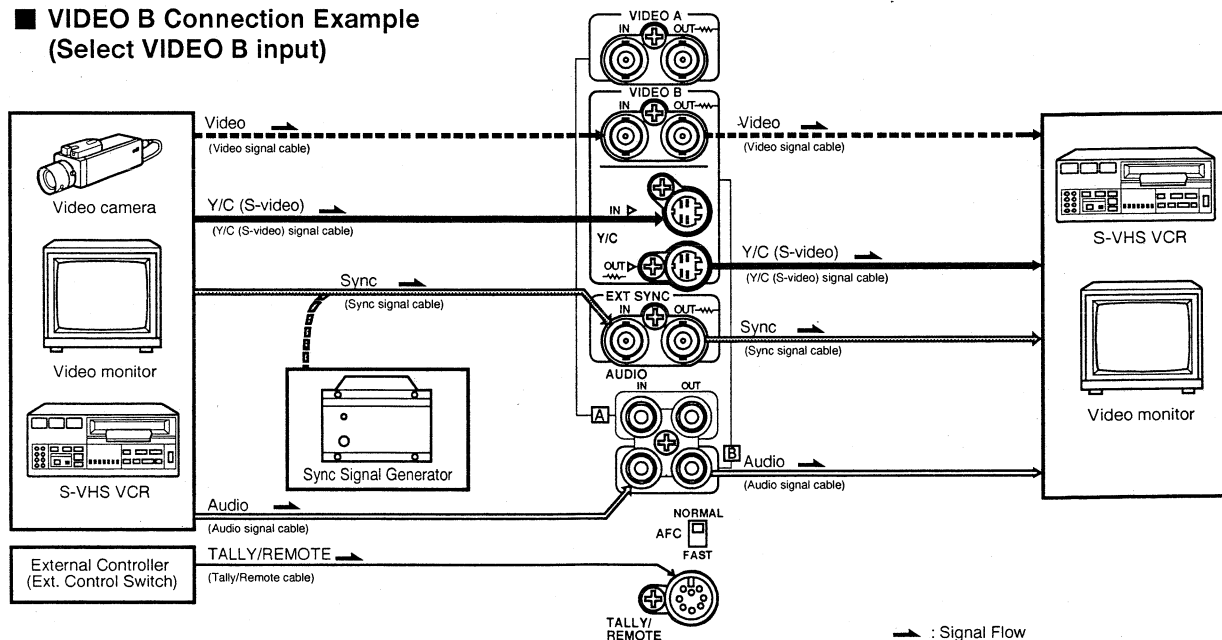
# I BASIC CONNECTION EXAMPLE

- \* Before connecting your system, make sure that all units are turned off.
- \* The illustration below shows some examples of different connections. Terminal connections may differ depending on the component connected. Be sure to refer to the instructions provided with the unit(s) you are connecting.
- \* Each pair of input (IN) and output (OUT) terminals are bridge-connected. Do not connect input and output terminals inversely.
- \* If you're not connecting any equipment to a bridged output (OUT) terminal, be sure not to connect any other cables to the bridged output (OUT) terminal as this will cause the terminating resistance switch to open (auto terminate function).
- \* When making a bridge connection, connect the input (IN) and output (OUT) terminals on the monitor to separate video components.  
(For example, if both terminals are connected to the same VCR, resonance may occur except during playback. This is caused by the same video signal "looping" between the VCRs, and is not a malfunction.)
- \* Select the video input (VIDEO A or VIDEO B) with the VIDEO A/B switch on the front panel.

## ■ VIDEO A Connection Example (Select VIDEO A input)



## ■ VIDEO B Connection Example (Select VIDEO B input)



# I TROUBLESHOOTING

Solutions to common problems related to your monitor are described here. If none of the solutions presented here solves the problem, unplug the monitor and consult a JVC-authorized dealer or service center for assistance.

Problems	Points to be checked	Measures
No power supply.	Is the AC or DC power plug loosened or disconnected?	Firmly insert the power plug.
	Is the battery fully charged (when using DC power)?	Charge the battery, or replace it with a charged battery. (Refer to the instructions provided with the battery.)
No picture with the power on.	Is the video signal output from the connected component?	Set the connected component correctly.
	Is the input signal selected properly?	Select the required video signal input with the VIDEO A/B switch. (See page 4.)
	Is the video cable disconnected?	Connect the video signal cable firmly. (See page 8.)
No sound.	Is the audio signal output from the connected component?	Set the connected component correctly.
	Is the volume output set at the minimum position?	Adjust the VOLUME control. (See page 4.)
	Is the audio cable disconnected?	Connect the audio signal cable firmly. (See page 8.)
Shaking picture.	Is the monitor close to a device generating a strong magnetic field (motor, transformer, etc.)?	Move the device away from the monitor until the picture stabilizes.
No colour, wrong colour, or dark picture.	Is the colour system selected properly?	Set the colour system correctly with the NTSC/PAL switch. (See page 4.)
	Is the COLOR OFF (colour off) switch set properly?	Set the COLOR OFF (colour off) switch to the OFF (■) position. (See page 5.)
	Has the picture control setting (CONTRAST, BRIGHT, CHROMA or PHASE) been changed?	Set each picture control to the standard setting (center) position. (See page 4.)
Unnatural, irregularly coloured, or distorted picture.	Is the monitor close to a speaker, magnet or any other device generating a strong magnetic field?	Move the device away from the monitor and turn the monitor's power off. Wait at least 30 minutes, then turn the power on again.
Dark stripes at the top and bottom of the screen, picture vertically squeezed.	Is the aspect ratio set to 16:9 (■)?	Press the 4:3/16:9 switch to restore the normal 4:3 mode (■). (See page 4.)
Picture flows.	Is the EXT SYNC switch set properly?	Set the EXT SYNC switch properly. (See page 4.)
Front panel switches do not function.	Is the monitor being controlled by an external control unit via the TALLY/REMOTE terminal?	Set the control on the external unit of the same function as that on the monitor's front panel to the OFF (■) position, or disconnect the unit from the TALLY/REMOTE terminal. (See page 7 and 8.)
External control not possible with the unit connected to TALLY/REMOTE terminal.	Is the switch on the front panel of the same function as that on the external control unit to the ON (■) position?	Set the control on the front panel of the same function as that on the external control unit to the OFF (■) position. (See pages 4, 5, 7 and 8.)

## The following are not malfunctions:

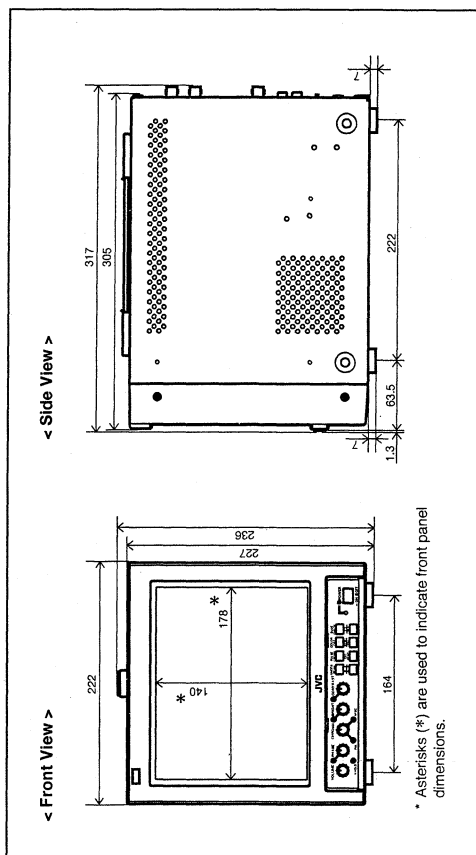
- When a bright still image (such as a white cloth) is displayed for a long period, it may appear to be coloured. This is due to the structure of the cathode ray tube and will be deleted when another image is displayed.
- You experience a mild electric shock when you touch the picture tube. This phenomenon is due to a normal buildup of static electricity on the CRT and is not harmful.
- The monitor emits a strange sound when the room temperature changes suddenly. This is only a problem if an abnormality appears on the screen as well.

# SPECIFICATIONS

- **Type** : Colour video monitor
- **Colour system** : NTSC, PAL
- **Picture tube** : 25cm measured diagonally, flat-square type, 90° deflection, in-line gun, vertical line trio type (phosphor stripe pitch 0.5 mm)
- **Effective screen size** : Width 175 mm  
Height 137 mm  
Diagonal 222 mm
- **Scanning frequency** : (H) 15.734 kHz (NTSC)  
15.625 kHz (PAL)
- **Horizontal resolution** : (V) 59.94 Hz (NTSC)  
50 Hz (PAL)
- **Input terminals** : 280 TV lines or more (Y/C input mode)
- **VIDEO A** : Composite video:  
1 line, BNC connector x 2,  
1 Vp-p, 75 Ω, negative sync  
(bridge connection possible,  
auto termination)
- **VIDEO B** : Composite video:  
1 line, BNC connector x 2,  
1 Vp-p, 75 Ω negative sync  
(bridge connection possible,  
auto termination)  
Y/C-separated:  
1 line, mini-DIN 4-pin  
connector x 2  
Y: 1.0 Vp-p, 75 Ω  
C: 0.286 Vp-p, 75 Ω (NTSC)  
0.3 Vp-p, 75 Ω (PAL)  
(bridge connection possible,  
auto termination)  
\* Y/C priority when both  
connected
- **AUDIO A** : 1 line (monaural), RCA pin x 2  
0.5 V rms, high-impedance  
(bridge connection possible)
- **AUDIO B** : 1 line (monaural), RCA pin x 2  
0.5 Vrms, high-impedance  
(bridge connection possible)
- **External sync** : Composite sync  
1 line, BNC connector x 2  
0.2-4 Vp-p, 75 Ω  
(bridge connection possible,  
auto termination)
- **Tally/Remote** : 1 line, DIN 8-pin x 1
- **Audio power output** : 1 W (monaural)
- **Built-in speaker** : 8 cm round x 1  
impedance of 8 Ω
- **Environmental conditions** : Operation temperature:  
0-40 °C  
Operation humidity:  
20-80% (non-condensing)
- **Power requirements** : 230 V AC, 50/60 Hz  
or 12 V DC  
\* the possible range of AC IN  
function : 100-230 VAC,  
50/60 Hz  
3.5A (12 V DC)
- **Power consumption** : 0.41A (230 V AC)  
3.5A (12 V DC)
- **Dimensions** : Width 222 mm  
Height 236 mm  
Depth 317 mm
- **Weight** : Approx. 7.4 kg
- **Accessory** : AC power cord  
TM-1010PN; for European  
continent countries  
(approx. 2 m) x 1  
TM-1010PN-K; for the United  
Kingdom (approx. 2 m) x 1

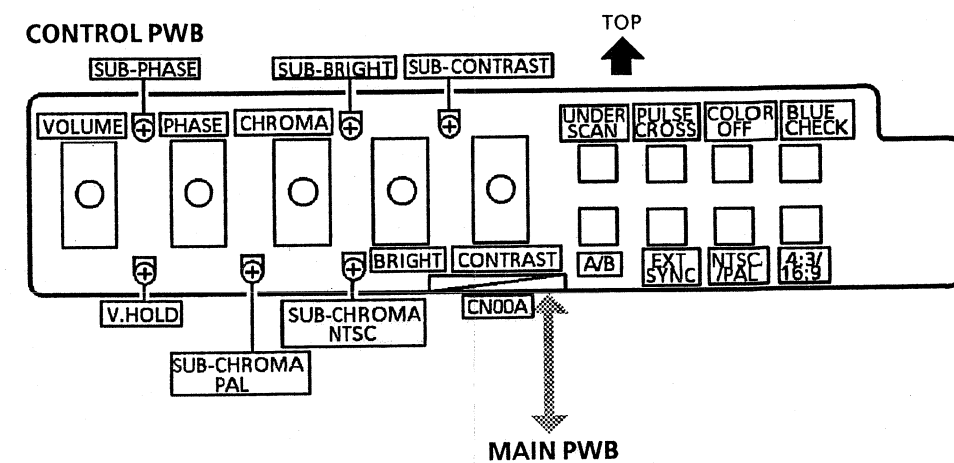
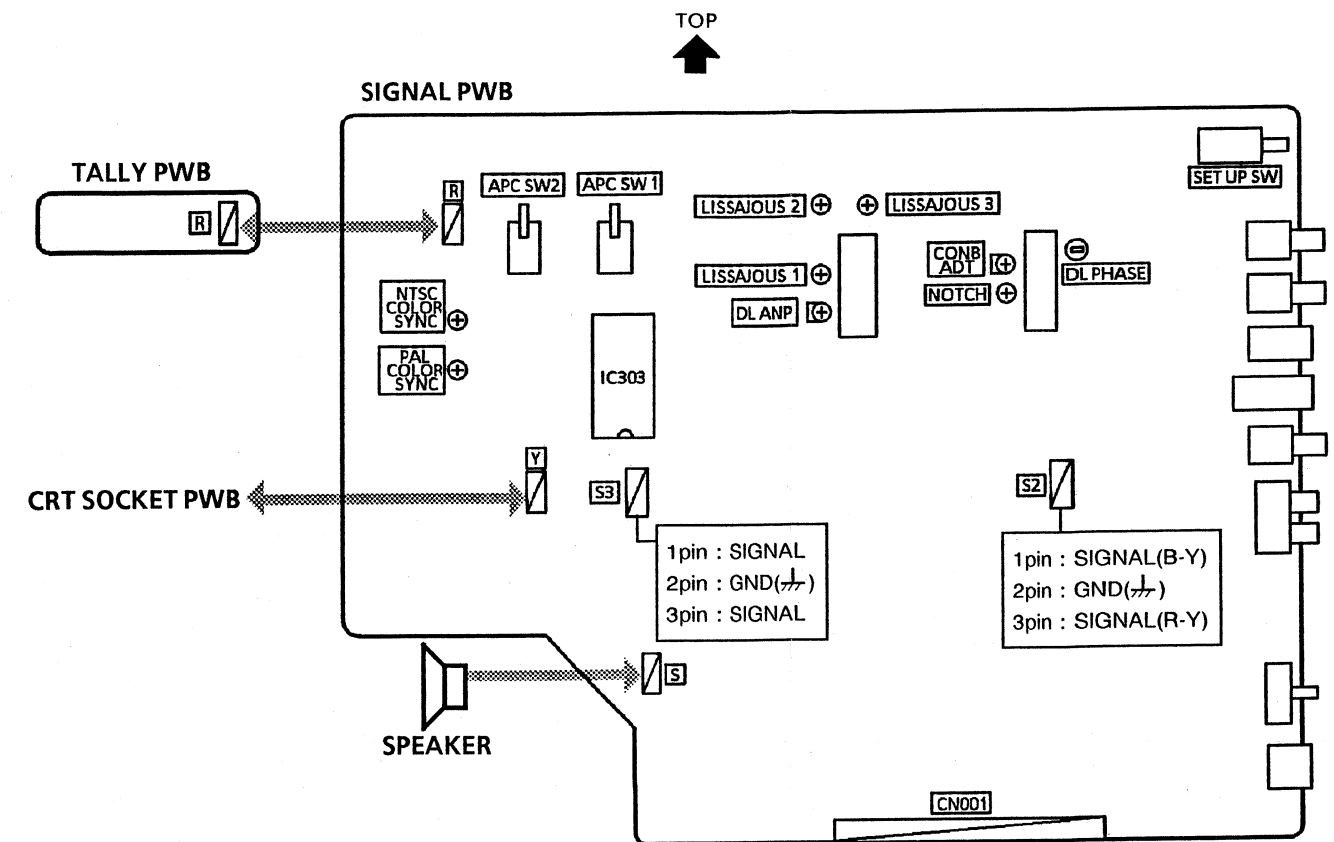
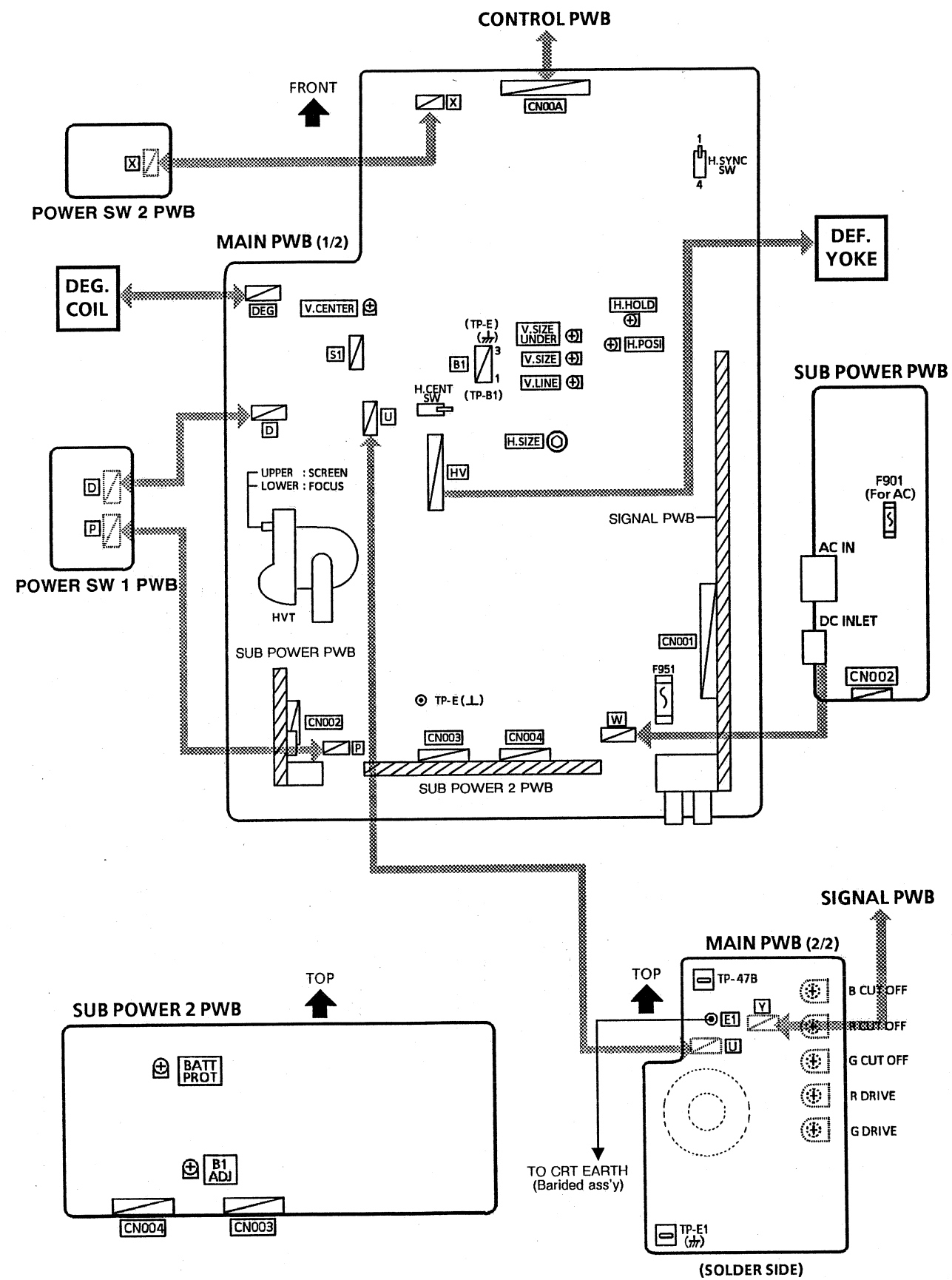
## Dimensions

Unit : mm

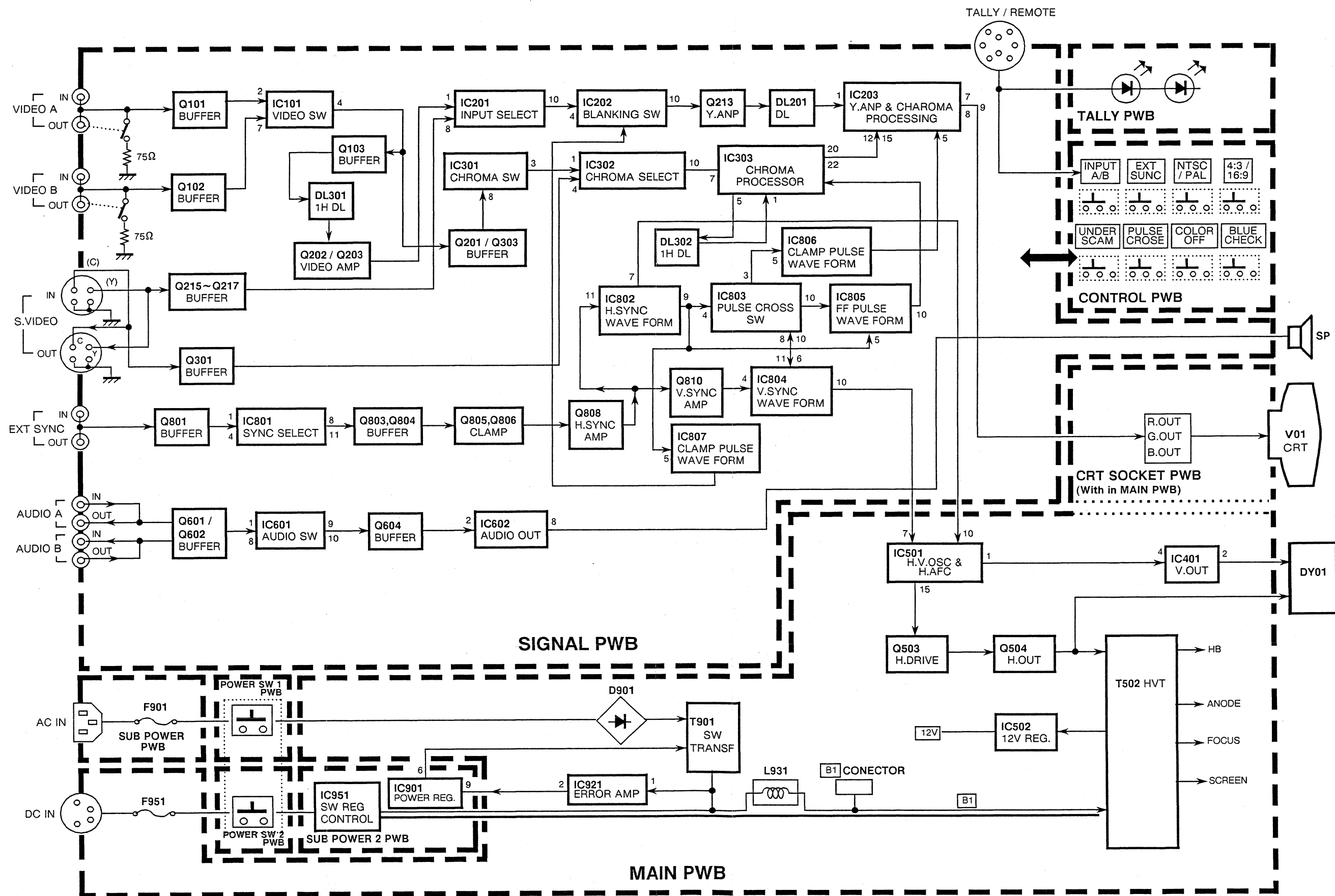


\* Illustrations used in this manual are for explanatory purposes only. The appearance of the actual product may differ slightly.  
\* E. & O. E. Design and specifications subject to change without notice.

# MAIN PARTS LOCATION AND ALIGNMENTS LOCATION



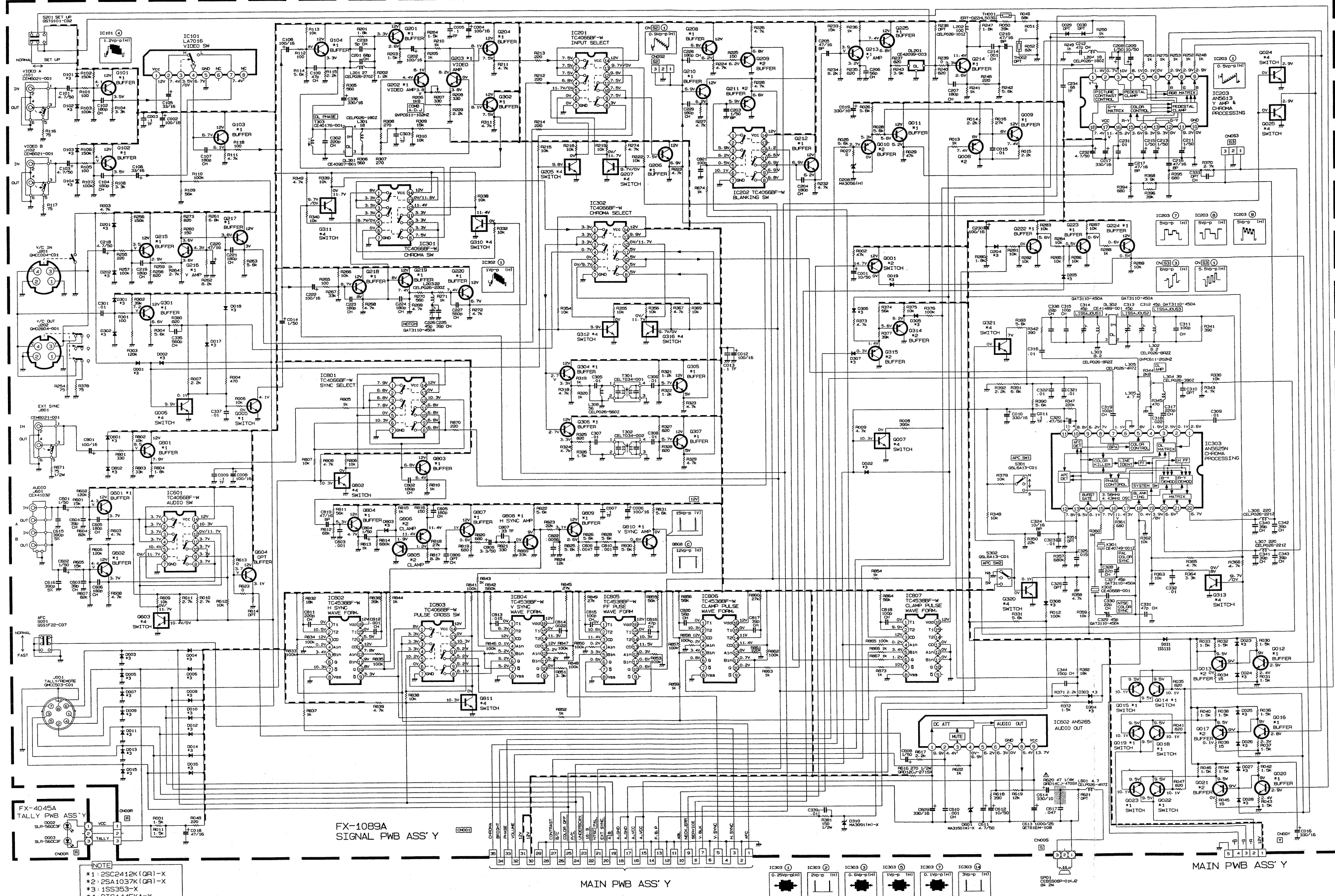
# BLOCK DIAGRAM



# CIRCUIT DIAGRAMS AND PWB PATTERNS

SIGNAL PWB, TALLY PWB CIRCUIT DIAGRAM

Refer to the following PWB pattern : SIGNAL PWB PATTERN 2-11~2-12 page.  
TALLY PWB 2-15 page.





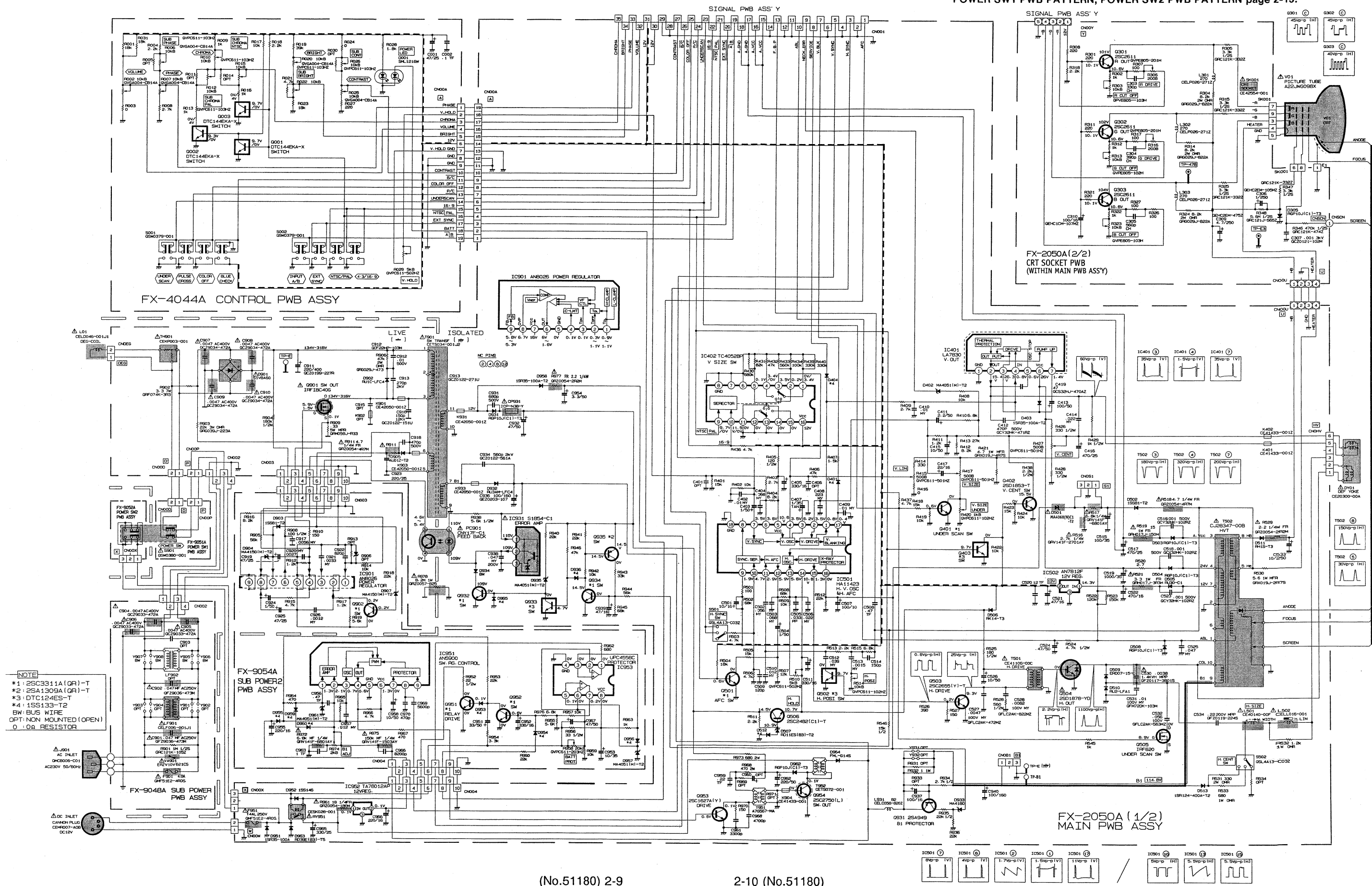
MAIN PWB (1/2), CRT SOCKET PWB(2/2), CONTROL PWB, SUB POWER PWB, SUB POWER2 PWB,  
POWER SW1 PWB, POWER SW2 PWB, CIRCUIT DIAGRAMS

Refer to the following PWB pattern : MAIN PWB PATTERN(1/2) page 2-13~2-14. CONTROL PWB PATTERN page 2-16.

CRT SOCKET PWB PATTERN(2/2) page 2-15.

SUB POWER PWB PATTERN, SUB POWER2 PWB PATTERN page 2-14.

POWER SW1 PWB PATTERN, POWER SW2 PWB PATTERN page 2-15.

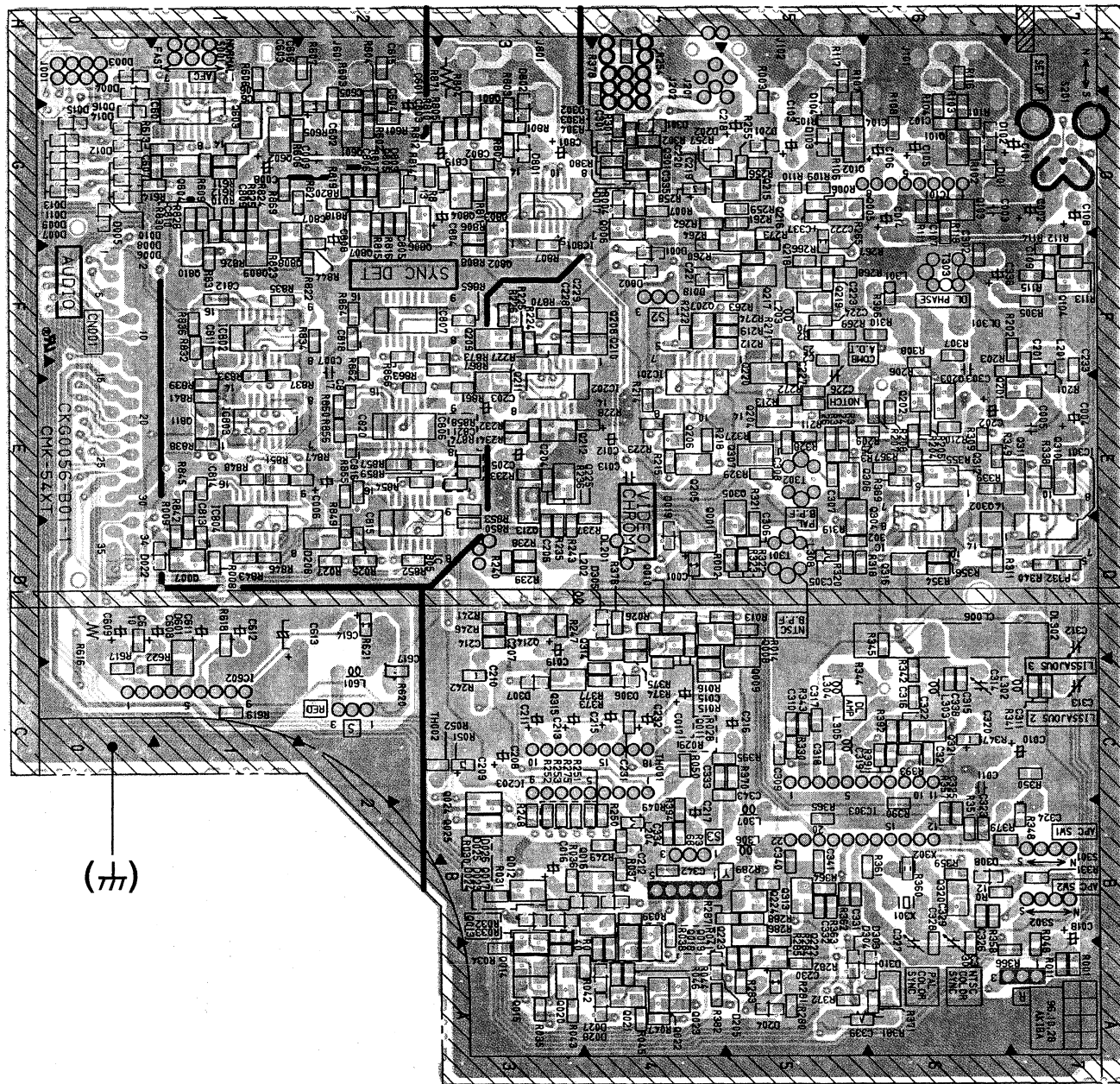


## SIGNAL PWB PATTERN (SOLDER SIDE)

[FX-1089A]

(Magnification Rate 89%)

↑ REAR

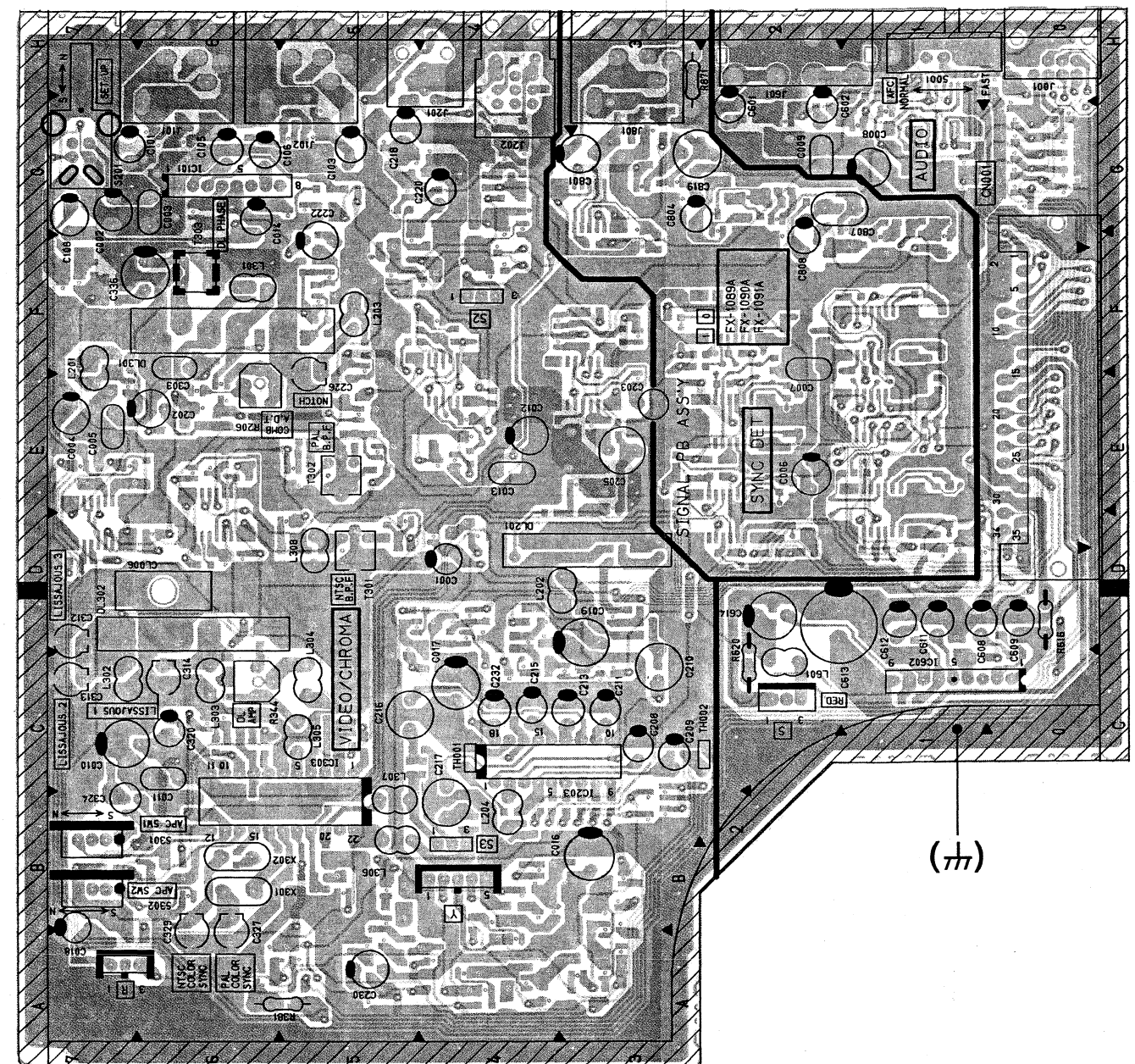


## SIGNAL PWB PATTERN (PARTS SIDE)

[FX-1089A]

(Magnification Rate 89%)

↑ REAR

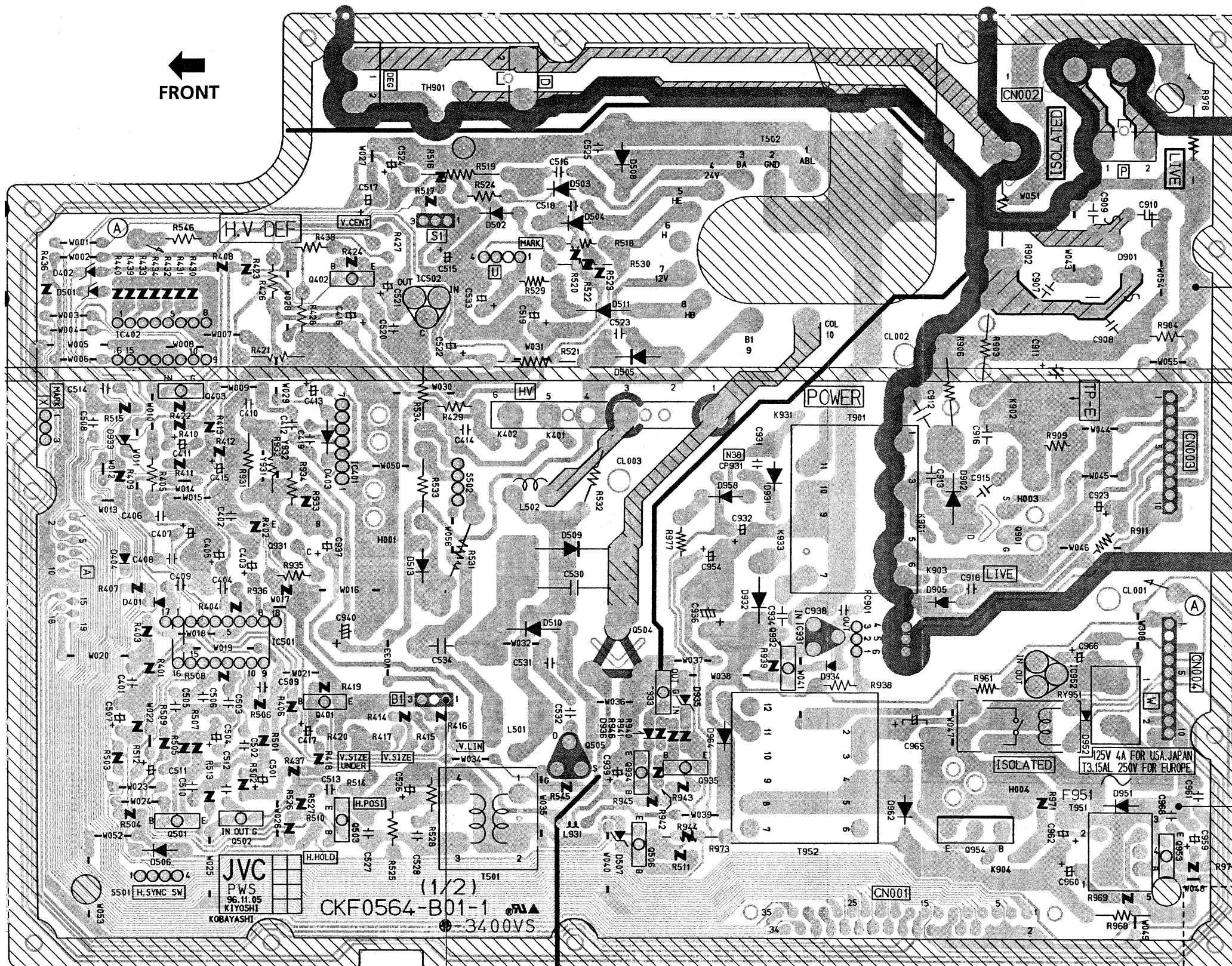




MAIN PWB PATTERN

[FX-2050A]

(Magnification Rate 110%)



(TP-B1)

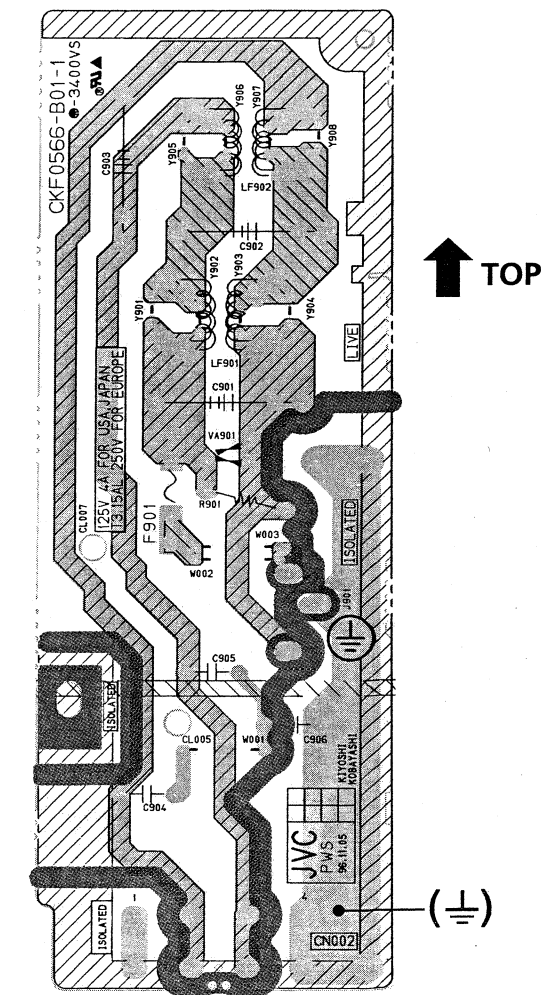
(No.51180) 2-13

2-14 (No.51180)

SUB POWER PWB PATTERN

[FX-9048A]

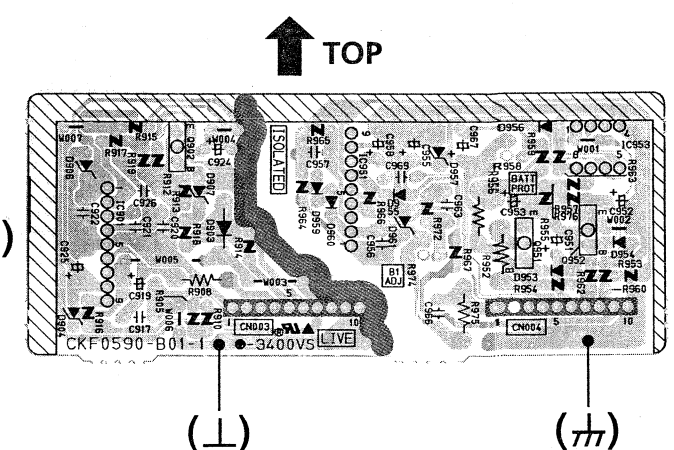
(Magnification Rate 75%)



SUB POWER2 PWB PATTERN

[FX-9054A]

(Magnification Rate 75%)



# SAFETY PRECAUTIONS

1. The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
4. **Don't short between the LIVE side ground and ISOLATED(NEUTRAL) side ground or EARTH side ground when repairing.**  
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED(NEUTRAL) : (⚡) side GND and EARTH : (⊕) side GND. Don't short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time.  
If above note will not be kept, a fuse or any parts will be broken.
5. If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B<sub>1</sub> POWER SUPPLY).
6. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
7. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k $\Omega$  2W resistor to the anode button.
8. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

## 9. Isolation Check

### (Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

#### (1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second.

(. . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

#### (2) Leakage Current Check

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

##### • Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500 $\Omega$  10W resistor paralleled by a 0.15 $\mu$ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

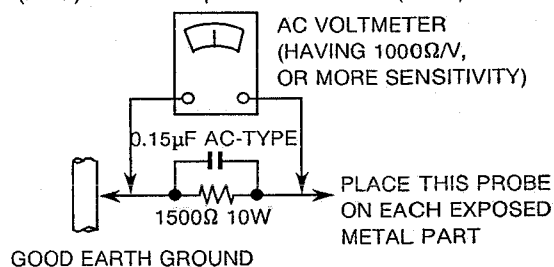


Fig.A

# SPECIFIC SERVICE INSTRUCTIONS

## DISASSEMBLY PROCEDURE

### [CAUTION]

- \* Even with the power switch off, some parts of the set are live. Be sure to disconnect the power cord from the AC outlet before disassembly and reassembly.

### REMOVING THE TOP COVER

1. Take out 4 screws (A) and 4 screws (B).
2. Slightly spread the bottom of the top cover. Shift the cover rearward and raise it upward to remove it.

### REMOVING THE REAR PANEL

- Remove the top cover.
1. Take out 4 screws (C).
  2. Shift the top portion of the rear panel slightly rearward and raise it upward to remove it.

### REMOVING THE GUARD SHEET

- Remove the top cover and rear panel.
1. Pull out the rivet.
  2. Shift the guard sheet upward to remove it.

### REMOVING THE BOTTOM COVER

- After removing the top cover, rear panel and terminal bracket, follow the steps given below.
1. Place the front surface downward, then stand the bottom cover while facing it toward you.  
At this time, care must be exercised not to damage the front panel and CRT surface.
  2. Loosen the 2 screws marked (G) as shown in the figure.
  3. After pulling the rear panel side of the bottom cover toward you slightly, keep the chassis base from the bottom cover slightly.
  4. When the chassis base has been kept from the bottom cover slightly, pull the bottom cover upward while leaving the situation as it is, then remove the bottom cover.
  5. When the bottom cover has been removed, you can check the main PWB and control PWB in such a situation.

### REMOVING THE TERMINAL BRACKET

- Remove the top cover and rear panel.
1. Take out 2 screws (D), 7 screws (E) and 1 screw (F).
  2. Slightly shift the terminal bracket rearward and raise it upward to remove it.

### REMOVING THE CHASSIS BASE WITH THE CHASSIS

- Remove the top cover.
  - Remove the rear panel.
1. Remove the claws located at the left and right sides of the bottom of the front panel toward outside.
  2. While pulling the chassis base with the chassis rearward, remove it.

### REMOVING THE POWER SW

- Remove the top cover.
  - Remove the rear panel.
  - Remove the chassis base even with the power switch off.
1. Take out the screw (H).
  2. Remove the POWER SW sheet.
  3. Press the claws (Y) and (Z) to detach the POWER SW 2 PWB. Then slightly raise the POWER SW 2 PWB.
  4. The POWER SW 1 PWB can be removed by raising it after pressing the claws (X). (see Fig. 1)

### REMOVING CONTROL PWB

- Remove the top cover.
  - Remove the rear panel.
  - Remove the chassis base.
1. The CONTROL PWB can be removed by simply raising it.

### REMOVING THE CRT

- Remove the top cover.
  - Remove the rear panel.
  - Remove the chassis base.
1. Take out 4 screws (K).
  2. Remove the CRT from the front panel.

### REMOVING THE SPEAKER

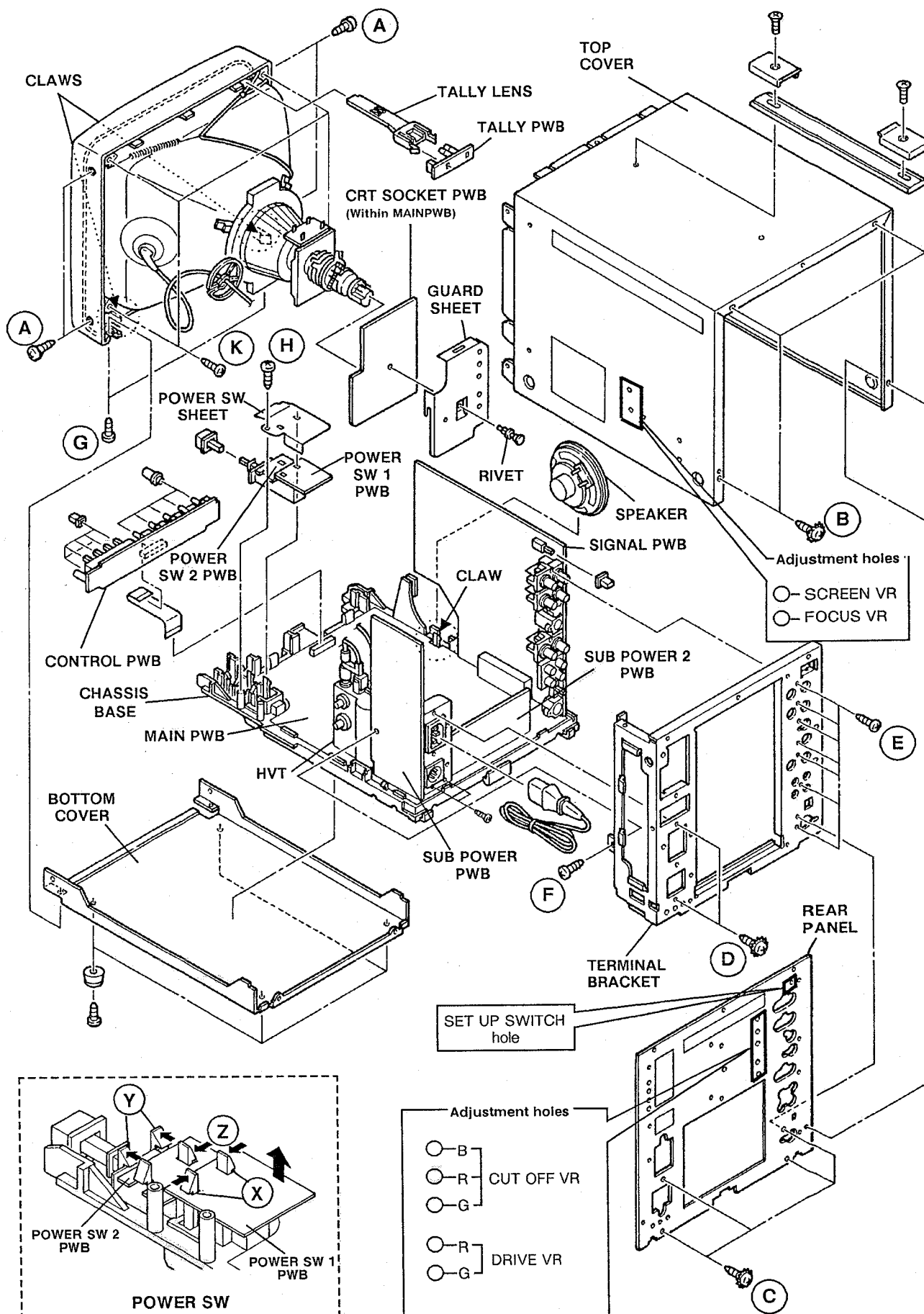
- Remove the top cover.
  - Remove the rear panel.
  - Remove the terminal bracket.
1. Remove the speaker code from the speaker.
  2. Remove the signal PWB.
  3. Disengage the claw under the speaker.
  4. Pull up the speaker.

### [CAUTION]

- \* When erecting the chassis, be careful so that there will be no contacting with other PW board.
- \* Before turning on power, make sure that the wire connector, CRT earth wire and other connectors properly connected.

### WIRE CLAMPING AND CABLE TYING

1. Be sure to clamp the wire.
2. Never remove the cable tie used for tying the wires together. Should it be inadvertently removed, be sure to tie the wires with a new cable tie.



# REPLACEMENT OF CHIP COMPONENT

## ■CAUTIONS

1. Avoid heating for more than 3 seconds.
2. Do not rub the electrodes and the resist parts of the pattern.
3. When removing a chip part, melt the solder adequately.
4. Do not reuse a chip part after removing it.

## ■SOLDERING IRON

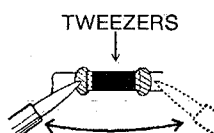
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

## ■REPLACEMENT STEPS

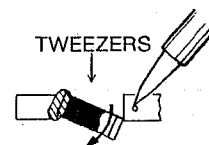
### 1. How to remove Chip parts

#### ●Resistors, capacitors, etc

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.

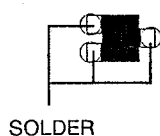


- (2) Shift with tweezers and remove the chip part.

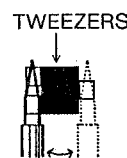


#### ●Transistors, diodes, variable resistors, etc

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

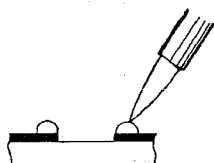


**Note:** After removing the part, remove remaining solder from the pattern.

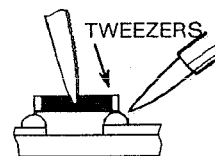
### 2. How to install Chip parts

#### ●Resistors, capacitors, etc

- (1) Apply solder to the pattern as indicated in the figure.



- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.



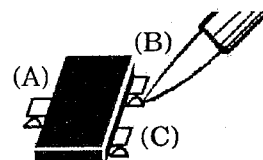
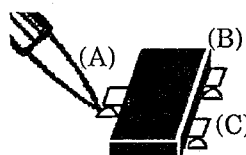
#### ●Transistors, diodes, variable resistors, etc

- (1) Apply solder to the pattern as indicated in the figure.

- (2) Grasp the chip part with tweezers and place it on the solder.

- (3) First solder lead A as indicated in the figure.

- (4) Then solder leads B and C.





# SERVICE ADJUSTMENTS

## PRIOR TO STARTING ADJUSTMENT

1. Supply power to the set and measuring instruments and allow to warm up for at least 30 minutes.
2. Confirm the proper AC power voltage is being supplied.
3. Use care not to disturb controls and switches not mentioned in the adjustment items.
4. Refer to adjustment settings and set user operated controls (bright, contrast, chroma, etc.) to the indicated positions.

## TOOLS AND FIXTURES FOR ADJUSTMENT

- DC volimeter (digital voltmeter)
- Oscilloscope
- Signal generator (PAL / NTSC systems)
  - Color bar and split color bar patterns
  - Crosshatch pattern
  - Cross pattern
  - Red raster pattern
  - Green raster pattern
  - Blue raster pattern
  - Phillips pattern (including R-Y and B-Y)
  - TV resolution pattern
- Color analyzer

## ADJUSTMENT SETTINGS

### 1. Front controls

CONTRAST	Center click position
BRIGHT	Center click position
CHROMA	Center click position
PHASE	Center click position
VOLUME	Center

### 2. Front SW

UNDER SCAN	OFF
PULSE CROSS	OFF
COLOR OFF	OFF
BLUE CHECK	OFF
INPUT A/B	A
EXIT SYNC	OFF
NTSC / PAL	PAL
4:3 / 16:9	4:3

### 3. Rear SW

AFC	NORMAL
SET UP	OFF

## FOCUS, SCREEN, CUT OFF AND DRIVE, SET UP SWITCH ADJUSTMENT HOLES

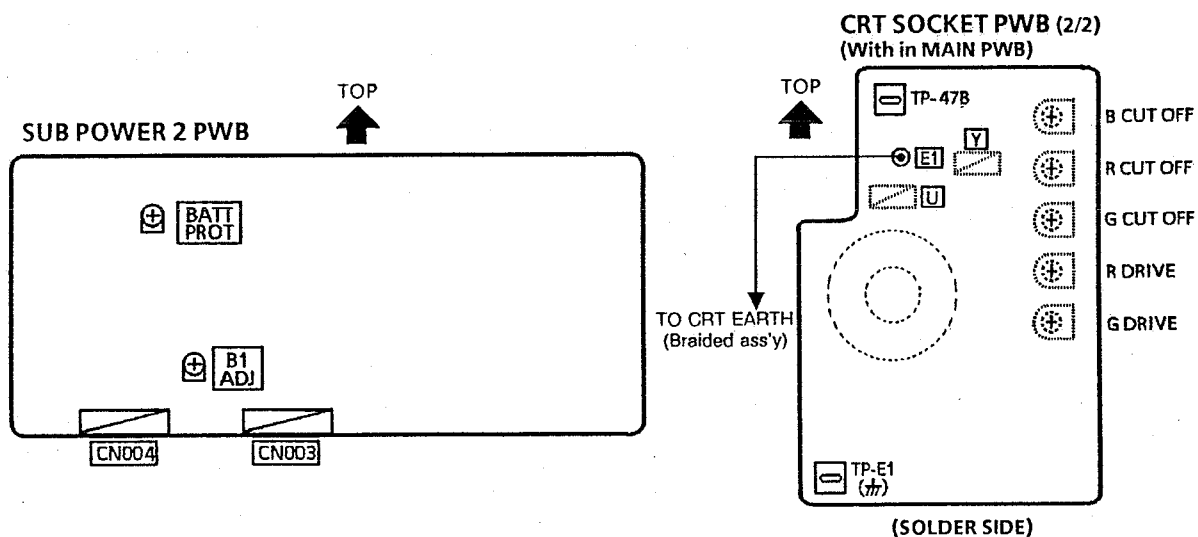
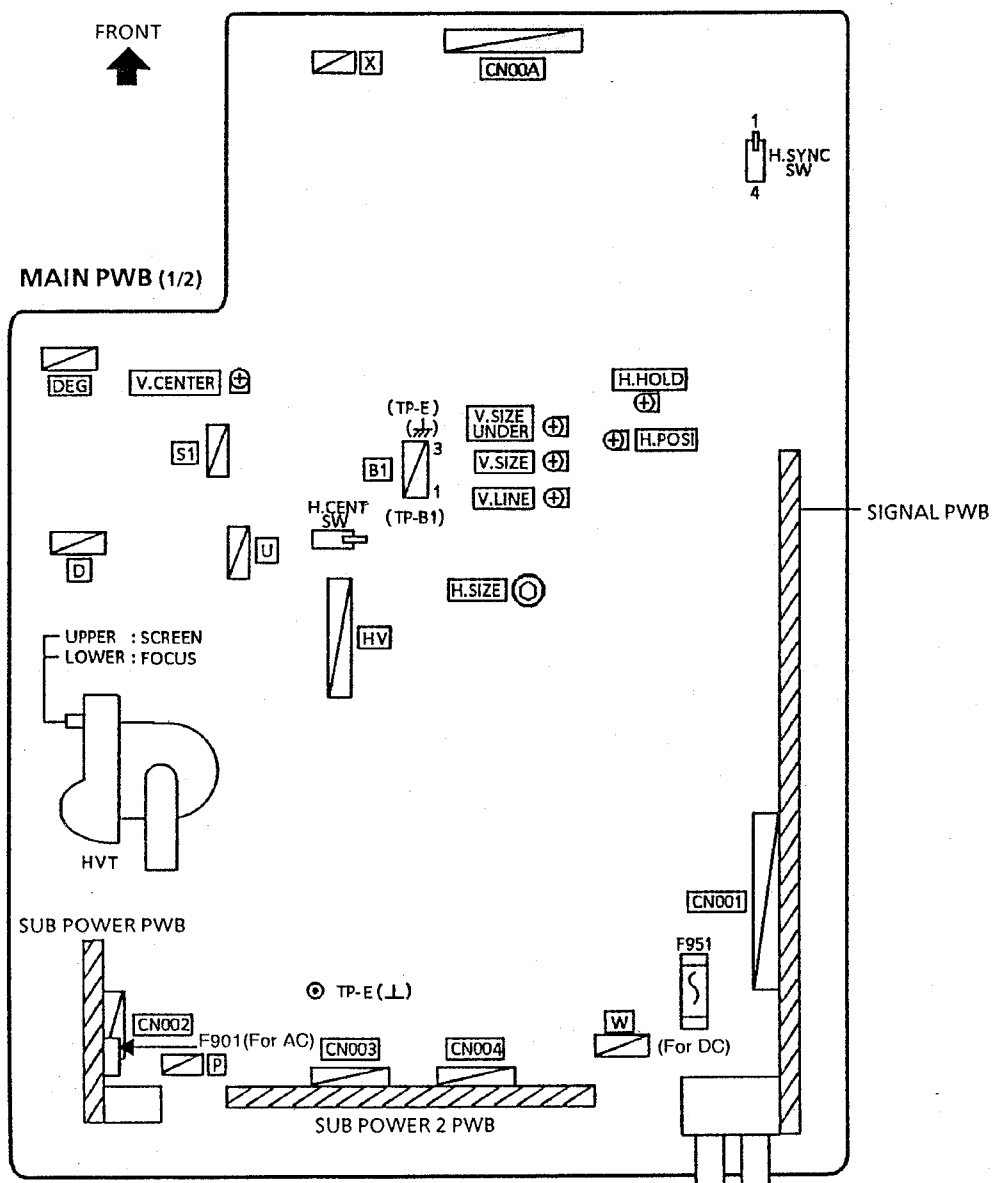
- The Focus and Screen adjustment holes are on the side of the set (see Page 5).
- The Cut off and Drive adjustment holes are on the rear panel of the set (see Page 5).
- The SET UP SWITCH hole is on the rear panel of the set (see page 5).

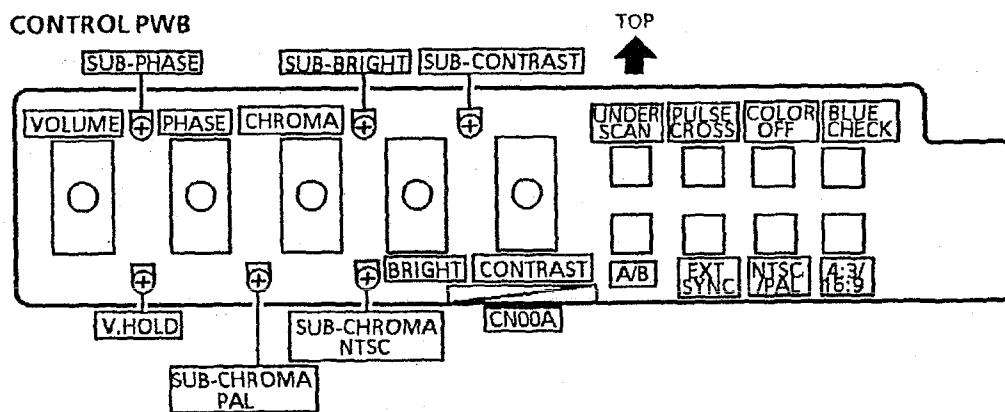
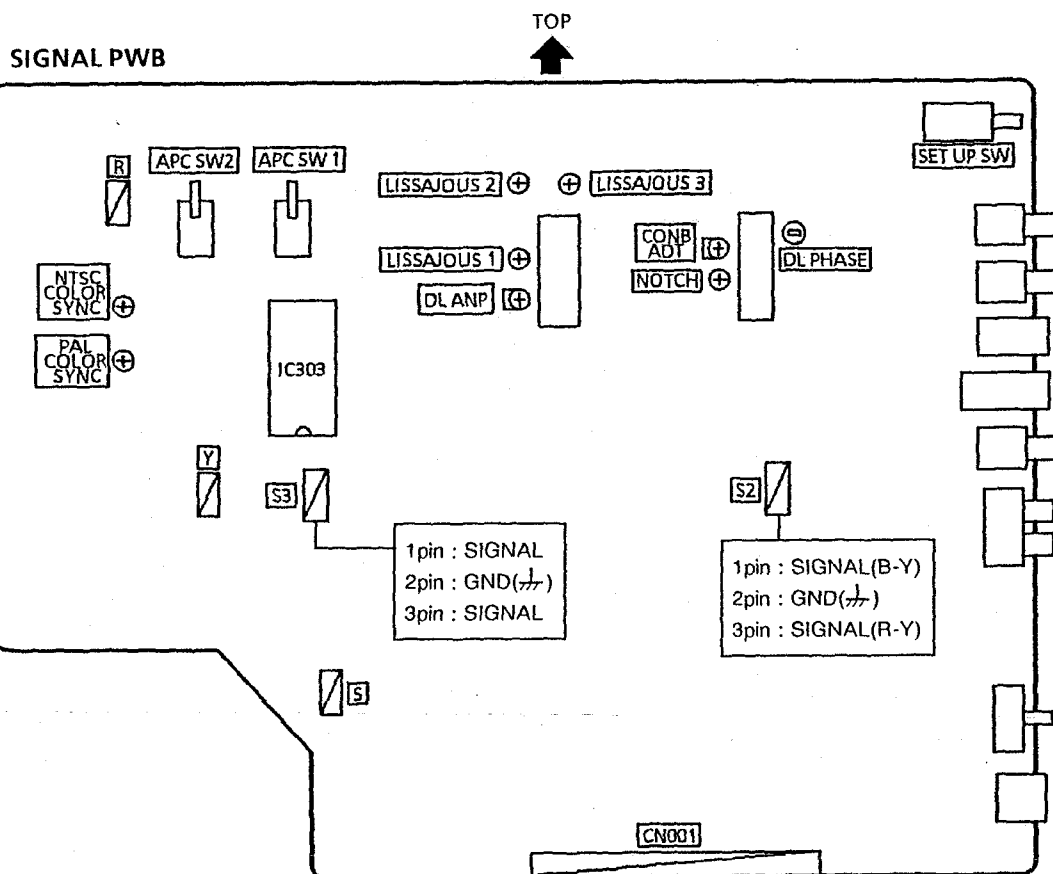
### [CAUTION]

Be sure to use a non-metallic screwdriver for adjusting there VRs. A metallic driver can cause damage by shorting.



# ADJUSTMENT LOCATIONS

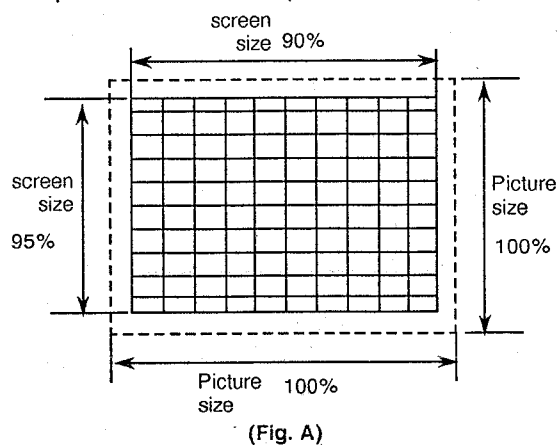


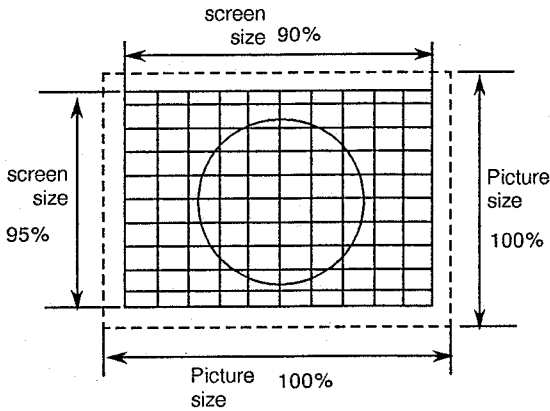
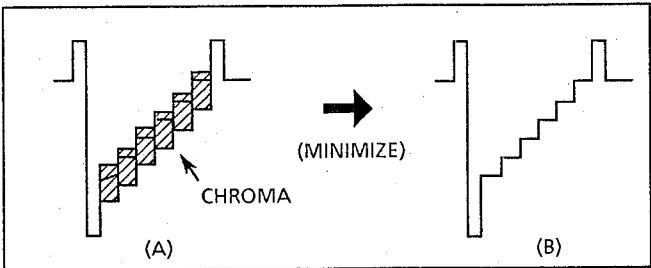
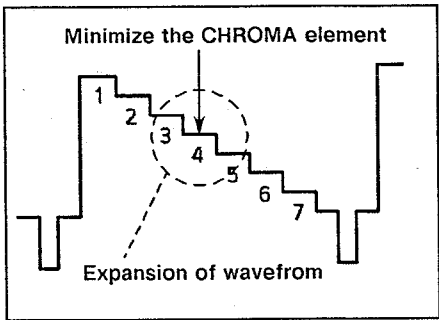


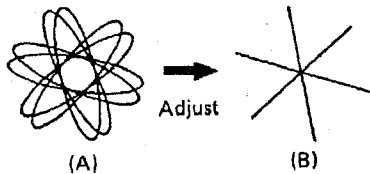
## ADJUSTING STEP

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
B1 voltage check (AC)	DC Voltmeter Signal generator	TP-B1(1 pin) TP-E(⚡)(3 pin) [B1] connector in MAIN PWB]		<ul style="list-style-type: none"> <li>Make sure that input power is 230V AC, 50Hz.</li> </ul> <ol style="list-style-type: none"> <li>Input an all-black signal.</li> <li>Confirm DC <math>114.8V \begin{smallmatrix} +1.0V \\ -1.3V \end{smallmatrix}</math> between TP-B1 and TP-E(⚡).</li> </ol>
B1 voltage check (DC)	DC Voltmeter Signal generator	TP-B1 (1 pin) TP-E(⚡)(3 pin) [B1] connector in MAIN PWB]	B1 ADJ VR [SUB POWER 2 PWB]	<ul style="list-style-type: none"> <li>Make sure that input power is <math>13V \pm 0.1V</math> DC.</li> </ul> <ol style="list-style-type: none"> <li>Input an all-black signal.</li> <li>Connect DC voltmeter TP-B1 and TP-E(⚡).</li> <li>Turn the B1 ADJ VR from rearward and bring B1 voltage to <math>DC\ 114.8V \pm 0.1V</math>.</li> <li>Make sure that the B1 voltage is <math>DC\ 114.8V \begin{smallmatrix} +1.0V \\ -1.3V \end{smallmatrix}</math> when the DC power supply voltage has been changed in the range of <math>10.4V \sim 18.0V</math>.</li> </ol> <ul style="list-style-type: none"> <li>Don't use metal screw driver.</li> </ul>
DC Shut off voltage adjustment	DC Voltmeter Signal generator		BATT. PROT VR [SUB POWER 2 PWB]	<ul style="list-style-type: none"> <li>Turn the BATT.PROT VR fully clock wise from rearward in advance.</li> <li>Make sure that input power is <math>12V \pm 0.1V</math> DC.</li> </ul> <ol style="list-style-type: none"> <li>Input an all-black signal.</li> <li>Connect digital voltmeter to DC terminal.</li> <li>Adjust DC power supply voltage bring to <math>DC\ 10.3 \pm 0.01V</math> (digital volt mete measured).</li> <li>Slightly turn the BATT.PROT VR counter-clock wise until power shut off. (POWER LED red lights)</li> <li>Turn on the power again and make sure that the POWER LED indicates a green color when the input power is 12V.</li> </ol> <p>※ When regaining the power supply, slightly increase the output voltage of the DC power supply, then turn the main switch of the TV set OFF before turning it ON again.</p>
Focus adjustment	Signal generator		FOCUS VR [HVT]	<ol style="list-style-type: none"> <li>Input a crosshatch signal.</li> <li>Turn the FOCUS VR to the range of best focus of the crosshatch signal.</li> </ol>
H.HOLD adjustment	Signal generator		H.SYNC SW H.HOLD VR [MAIN PWB]	<ol style="list-style-type: none"> <li>Input a monoscope pattern signal.</li> <li>Turn H.SYNC SW to left (4) side.</li> <li>Adjust the H.HOLD VR so that the monoscope pattern turn to normal in the screen.</li> <li>Turn H.SYNC SW to right side.</li> <li>Make sure that the normal picture can be displayed on the CRT immediately when the input select A / B SW was changed.</li> <li>Repeat the steps 2~4 above, if necessary.</li> </ol>

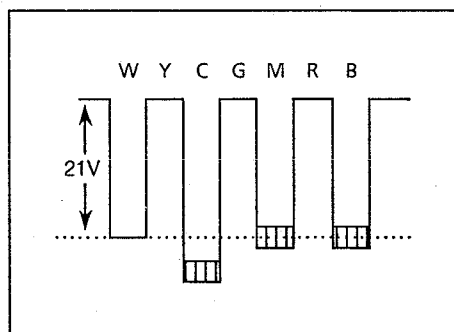
Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
V.HOLD adjustment	Signal generator		V.HOLD VR [FRONT PANEL]	<ol style="list-style-type: none"> <li>1. Input a NTSC colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the PAL side and the 4:3 / 16:9 SW on the front panel to the 16:9 side. (At this time, make sure that the colour in the picture on the CRT has died away and the vertical amplitude has been diminished in size.)</li> <li>3. Turn the V.HOLD VR on the front panel clockwise from its minimum position and stop it at the position where the vertical synchronization has been obtained.</li> <li>4. Return the NTSC / PAL SW to the NTSC side and the 4:3 / 16:9 SW to the 4:3 side, respectively, and make sure that the picture condition on the CRT is normal. On each mode (PAL, NTSC, UNDER SCAN, 16:9, etc.), confirm that the picture condition on the CRT is normal.</li> </ol>
H. Size and H. Center adjustment	Signal generator		H. SIZE COIL H. POSI VR H. CENT SW [MAIN PWB]	<ul style="list-style-type: none"> <li>• Perform after completing brightness and contrast adjustments.</li> </ul> <ol style="list-style-type: none"> <li>1. Input a NTSC crosshatch signal.</li> <li>2. Press the UNDER SCAN SW and the PULSE CROSS SW on the front panel, then roughly adjust the H. CENT SW to center the picture on the CRT. (At the same time, input PAL crosshatch signal and make sure that the center has not got out of place excessively.)</li> <li>3. After turning off the UNDER SCAN SW and the PULSE CROSS SW, adjust the H. POSI VR to center the picture on the CRT.</li> <li>4. Adjust the H. SIZE COIL to set the horizontal size to 90% (Fig. A)</li> <li>5. Turn on the UNDER SCAN SW and set the BRIGHT VR to a maximum and the CONTRAST VR to a minimum. Then, adjust the H.POSI VR so that the picture area on the CRT is positioned at the center of the raster.</li> <li>6. Turn off the UNDER SCAN SW and set the BRIGHT VR and the CONTRAST VR to the click position. Then, make sure that the horizontal position falls within the tolerance. If the horizontal position has been out of place, adjust the H.CENT SW to correct the position.</li> </ol>

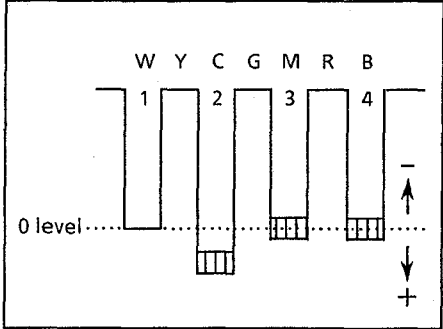
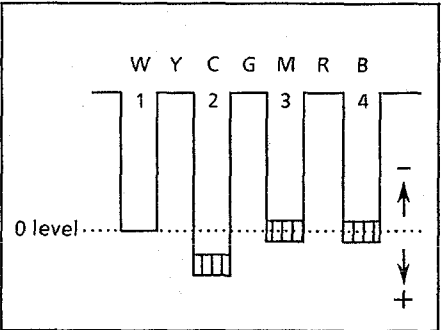


Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
V. Size V. Center and V. Linearity adjustment	Signal generator		V. SIZE VR V. CENTER VR V. LIN VR [MAIN PWB]	<ul style="list-style-type: none"> <li>Perform after completing brightness and contrast adjustments.</li> </ul> <ol style="list-style-type: none"> <li>1. Input a NTSC crosshatch circle signal.</li> <li>2. Adjust vertical linearity with the V. LIN VR.</li> <li>3. Adjust the V. CENTER VR to center the Picture on the CRT.</li> <li>4. Adjust the V. SIZE VR to set the vertical size to 95% (Fig. B).</li> <li>5. If necessary, readjust the V. LIN VR.</li> <li>6. Press the UNDER SCAN SW and adjust the V. SIZE UNDER VR so that circle on the screen becomes the same diameter vertically and horizontally.</li> <li>7. Input the PAL crosshatch circle signal and make sure that the vertical size of the circle falls within 92~97% when the UNDER SCAN SW is turned off, and that the diameter of the circle is the same vertically and horizontally when the UNDER SCAN SW is turned ON.</li> </ol>
 <p>(Fig. B)</p>				
Notch circuit adjustment	Signal generator Oscilloscope	[S2] connector 1&3 pin : Signal 2 pin : GND(⚡) [SIGNAL PWB]	NOTCH [SIGNAL PWB]	<ol style="list-style-type: none"> <li>1. Input a PAL colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the PAL side.</li> <li>3. Connect an oscilloscope to [S2] connector 1 or 3 pin.</li> <li>4. Adjust the NOTCH so that the figure is altered to (B) from (A).</li> </ol>
				
COMB FILTER adjustment	Signal generator Oscilloscope	[S2] connector 1&3 pin : Signal 2 pin : GND(⚡) [SIGNAL PWB]	DL PHASE TRANSF COMB A.D.J [SIGNAL PWB]	<ol style="list-style-type: none"> <li>1. Input a NTSC colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the NTSC side.</li> <li>3. Connect the oscilloscope to [S2] connector. In case the waveform can be expanded by the oscilloscope, expand the waveform to allow easy adjustment.</li> <li>4. Adjust the DL PHASE TRANSF so that the CHAROMA element becomes minimum.</li> <li>5. With the COMB A.D.J, adjust the CHAROMA element so that the element becomes minimum.</li> <li>6. Repeat steps 3 and 4.</li> </ol>
				

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
COLOR SYNC adjustment	Signal generator Oscilloscope		APC SW 1 & 2 NTSC COLOR SYNC [SIGNAL PWB]	<ol style="list-style-type: none"> <li>1. Input a NTSC colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the NTSC side.</li> <li>3. Switch the APC SW 1 &amp; 2 to the S side.</li> <li>4. While adjusting the NTSC COLOR SYNC, observe the picture in the screen : then stop the adjustment when the picture has been changed to a complete color-bar pattern from a striped pattern.</li> <li>5. Then return the APC SW 1 &amp; 2 to the N side.</li> <li>6. By switching the input select A / B SW twice, make sure that the complete colour-bar pattern obtained in the step 4 above will appear immediately.</li> </ol>
APC adjustment	Signal generator Oscilloscope	<b>S3</b> connector 1 pin : SIGNAL(B-Y) 2 pin : GND( $\overline{\text{A}}$ ) 3 pin : SIGNAL(R-Y)	APC SW 1 & 2 DL LEVEL VR LISSAJOUS 2 & 3 [SIGNAL PWB]	<ol style="list-style-type: none"> <li>1. Input a PAL colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the PAL side.</li> <li>3. Connect the probes of a dual-trace oscilloscope to <b>S3</b> connector.</li> <li>4. Set the APC SW 1, SW 2 to S.</li> <li>5. Set the oscilloscope tie axis to X-Y coordinates.</li> <li>6. Alternately adjust the DL LEVEL VR and LISSAJOUS 2 &amp; 3 to obtain the waveform B indicated in the figure.</li> <li>7. Return the APC SW1, SW2 to N.</li> </ol>
<div style="text-align: center;">  </div>				
White balance (low Light) adjustment	Signal generator		SET UP SW [SIGNAL PWB]  R CUT OFF VR G CUT OFF VR B CUT OFF VR [CRT SOCKET PWB]  SCREEN VR [MAIN PWB]	<ol style="list-style-type: none"> <li>1. Input a monoscope pattern signal.</li> <li>2. Set the SET UP SWITCH on the signal PWB to S to produce a single horizontal line.</li> <li>3. Turn the RED, GREEN and BLUE CUT OFF VRs fully counter-clockwise.</li> <li>4. Turn the SCREEN VR fully counter-clockwise, then gradually turn it clockwise until a single blue, green or red horizontal line just slightly appears.</li> <li>5. Turn the CUT OFF VR corresponding to the initial colour slightly clockwise.</li> <li>6. Adjust the CUT OFF VRs of the other two colors to where the three overlapped colors appear white.</li> <li>7. Return the SET UP SWITCH to normal(N).</li> <li>8. Set for a dark screen and fine adjust the R, G and B CUT OFF VRs to obtain the optimum white colour.</li> </ol>

Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
White balance (high light) adjustment	Signal generator (colour temperature meter)		R DRIVE VR G DRIVE VR [CRT SOCKET PWB]	<ol style="list-style-type: none"> <li>1. Input a monoscope pattern signal.</li> <li>2. Adjust the RED and GREEN DRIVE VRs to produce an overall white screen.</li> <li>• If a colour temperature meter is available : Measure the center of the screen with the sensor of the colour temperature meter. Adjust the RED and GREEN DRIVE VRs to obtain D6500° K.</li> <li>3. Turn the contrast and brightness VRs. Confirm correct white balance tracking from low light to high light.</li> </ol>
Brightness adjustment	Signal generator		SUB BRIGHT VR [CONTROL PWB]	<ul style="list-style-type: none"> <li>• Perform after completing white balance adjustments.</li> </ul> <ol style="list-style-type: none"> <li>1. Input a split colour bar signal.</li> <li>2. Adjust the SUB BRIGHT VR to eliminate illumination in the 0% black component.</li> </ol>
Contrast adjustment	Signal generator Oscilloscope	TP-47B TP-E(↗) [CRT SOCKET PWB]	SUB CONT. VR [CONTROL PWB]	<ol style="list-style-type: none"> <li>1. Input a colour bar signal (set for 0.525V between black and white).</li> <li>2. Connect an oscilloscope to TP-47B and TP-E(↗).</li> <li>3. Adjust the SUB CONTRAST VR to set the level indicated in the figure to 21V.</li> </ol>



Item	Test equipment	Test points	Adjustment locations	Adjustment procedure
Chroma adjustment	Signal generator Oscilloscope	TP-47B TP-E1(⚡) [CRT SOCKET PWB]	SUB CHROMA VR [CONTROL PWB]	<ol style="list-style-type: none"> <li>1. Input a PAL colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the PAL side.</li> <li>3. Connect an oscilloscope to TP-47B and TP-E1 (⚡).</li> <li>4. With the no. 1 level W taken as 0 level, adjust the SUB CHROMA (PAL) VR to set no. 4 B to 0 level.</li> </ol>
				
COLOR TINT adjustment	Signal generator Oscilloscope	TP-47B TP-E(⚡) [CRT SOCKET PWB]	SUB PHASE VR SUB CHAROMA VR [CONTROL PWB]	<ol style="list-style-type: none"> <li>1. Input a NTSC colour bar signal.</li> <li>2. Switch the NTSC / PAL SW on the front panel to the PAL side, and turn the BLUE CHECK SW on.</li> <li>3. Connect an oscilloscope to TP-47B and TP-E (⚡).</li> <li>4. With the no. 1 level W taken as 0 level, adjust the SUB PHASE VR to set no. 3 M to 0 level.</li> <li>5. With the no. 1 level W taken as 0 level, adjust the SUB CHROMA (NTSC) VR to set no. 4 B to 0 level.</li> </ol>
				



## PURITY, CONVERGENCE

### PURITY ADJUSTMENT

Before adjusting :

- Turn the screen VR to where the raster dose not appear.
- Set the PULSE CROSS SW to ON and turn BRIGHT VR to MAX, allow to run for at least 30 minutes, then return the switch to OFF and BRIGHT VR to back.
- Set the screen VR to the original position.

1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedge.
4. Input a Green Raster signal from the Signal Generator, and turn the screen to Green Raster.
5. Move the deflection yoke backward.
6. Bring the long lug of the purity magnets on the short lug and position them horizontally. (Fig. 3)
7. Adjust the gap between two lugs so that the Green Raster will come into the center of the screen. (Fig. 4)
8. Move the deflection yoke forward, and fix the position of the deflection yoke so that the whole screen will become green.
9. Insert the wedge to the top side of the deflection yoke so that it will not move.
10. Input a crosshatch signal.
11. Verify that the screen is horizontal.
12. Input red and Blue Raster signals, and make sure that purity is properly adjusted.

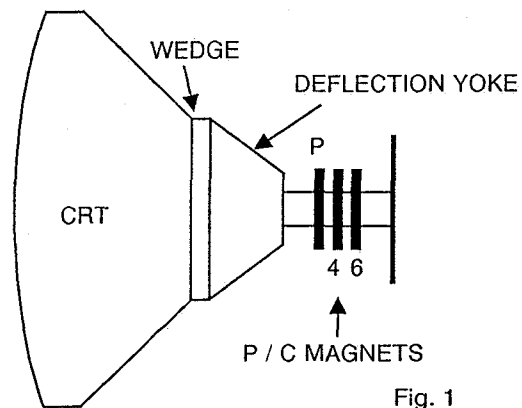


Fig. 1

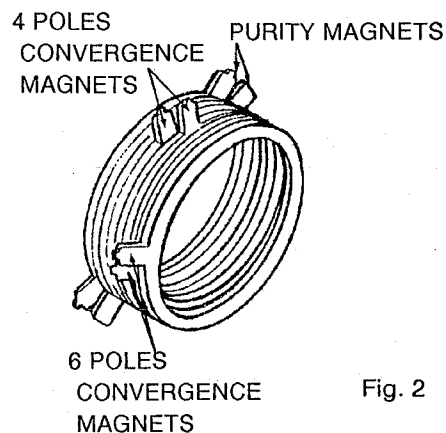


Fig. 2

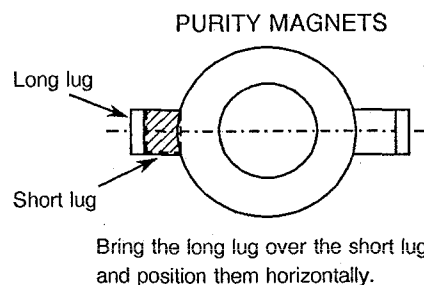


Fig. 3

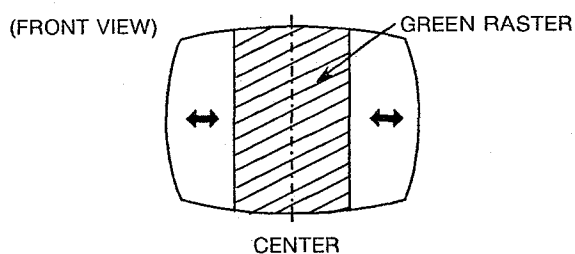


Fig. 4

### STATIC CONVERGENCE ADJUSTMENT

1. Input a crosshatch signal.
2. Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen and turn them to magenta (red/blue).
3. Using 6-pole convergence magnets, overlap the magenta (red/blue) and green lines in the center of the screen and turn them to white.
4. Repeat 2 and 3 above, and make best convergence.

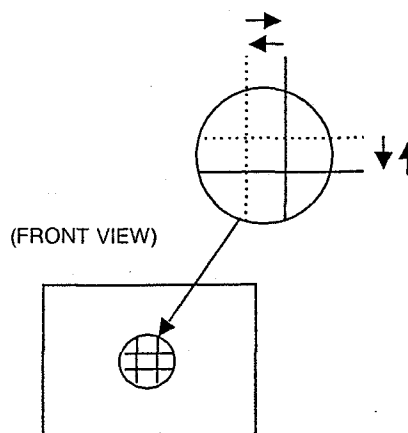


Fig. 1

### DYNAMIC CONVERGENCE ADJUSTMENT

1. Move the deflection yoke up and down and overlap the lines in the periphery. (Fig. 2)
2. Move the deflection yoke left to right and overlap the lines in the periphery. (Fig. 3)
3. Repeat 1 and 2 above, and make best convergence.

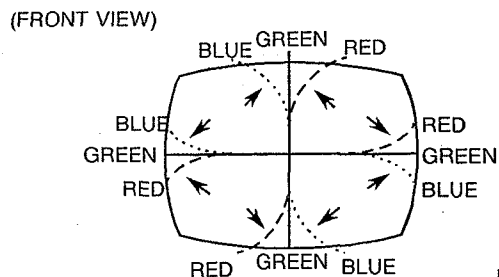


Fig. 2

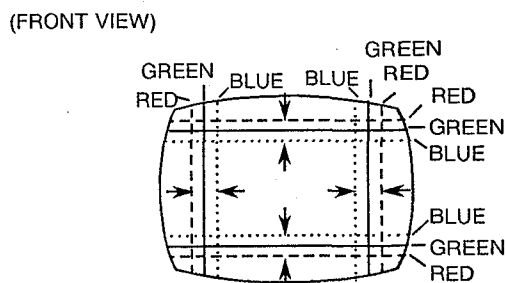


Fig. 3

- After adjustment, fix the wedge at the original position.  
Fasten the retainer screw of the deflection yoke.  
Fix the 6 magnets with glue.

# PARTS LIST

## CAUTION

- The parts identified by the  $\triangle$  symbol are important for the safety . Whenever replacing these parts, be sure to use specified ones to secure the safety .
  - The parts not indicated in this Parts List and those which are filled with lines — in the Parts No. columns will not be supplied .
  - P. W. Board Ass'y will not be supplied, but those which are filled with the Parts No. in the Parts No. columns will be supplied .
  - As a rule, the resistors and capacitors which are indicated as shown in "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" are not shown in the list of the parts on the board .
- When ordering the service parts, confirm the resistance/rated power, capacitance/rated voltage, and type of the parts, then order by the part No. indicated according to "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" .

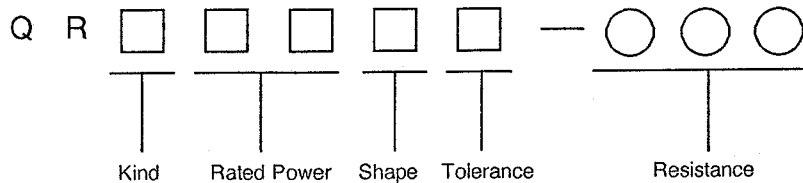
## ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
C R	Carbon Resistor	C CAP.	Ceramic Capacitor
F R	Fusible Resistor	E CAP.	Electrolytic Capacitor
P R	Plate Resistor	M CAP.	Mylar Capacitor
V R	Variable Resistor	HV CAP.	High Voltage Capacitor
HV R	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MF R	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MG R	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MP R	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OM R	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMF R	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNF R	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH V R	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CH MG R	Chip Metal Glazed Resistor	CH C CAP.	Chip Ceramic Capacitor
COMP. R	Composition Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
		CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Tantalum Bi-Polar Electrolytic Capacitor

TOLERANCES									
F	G	J	K	M	N	R	H	Z	P
$\pm 1\%$	$\pm 2\%$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$	$\pm 30\%$	+ 30% - 10%	+ 50% - 10%	+ 80% - 20%	+ 100% - 0%

# HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS

## ■ RESISTOR



Symbol	Part Name
C	COMP.R
D	C R
S	CH MG R

Symbol	Rated Power
0 1	1 w
1 2	1/2 w
1 4	1/4 w
1 6	1/6 w
1 8	1/8 w

Symbol	Shape
1	Straight lead
8	Chip

Indicate with first two-figure expressed by  $\Omega$  and following 0.  
 please note that, in case of resistance less than 10  $\Omega$ , a letter "R" will be effective as point.

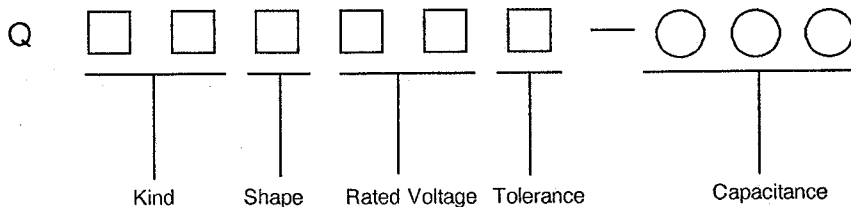
EX.

2.2  $\Omega$  = 2R2

470  $\Omega$  =  $47 \times 10^1 \rightarrow$  471

150k $\Omega$  =  $15 \times 10^4 \rightarrow$  154

## ■ CAPACITOR



Symbol	Part Name
CS	C CAP.
CS	CH C CAP.
ET	E CAP.
FM	M CAP.

	5Figure	0	1	2
	6Figure			
A			10V	100V
C			16V	160V
D				200V
E			25V	250V
H			50V	500V
J		6.3V	63V	
V			35V	

Indicate with first two-figure expressed by pF and following 0.  
 Please note that, in case of capacitance less than 10 pF a letter "R" will be effective as point.

EX

5pF = 5R0

1000pF =  $10 \times 10^2 \rightarrow$  102

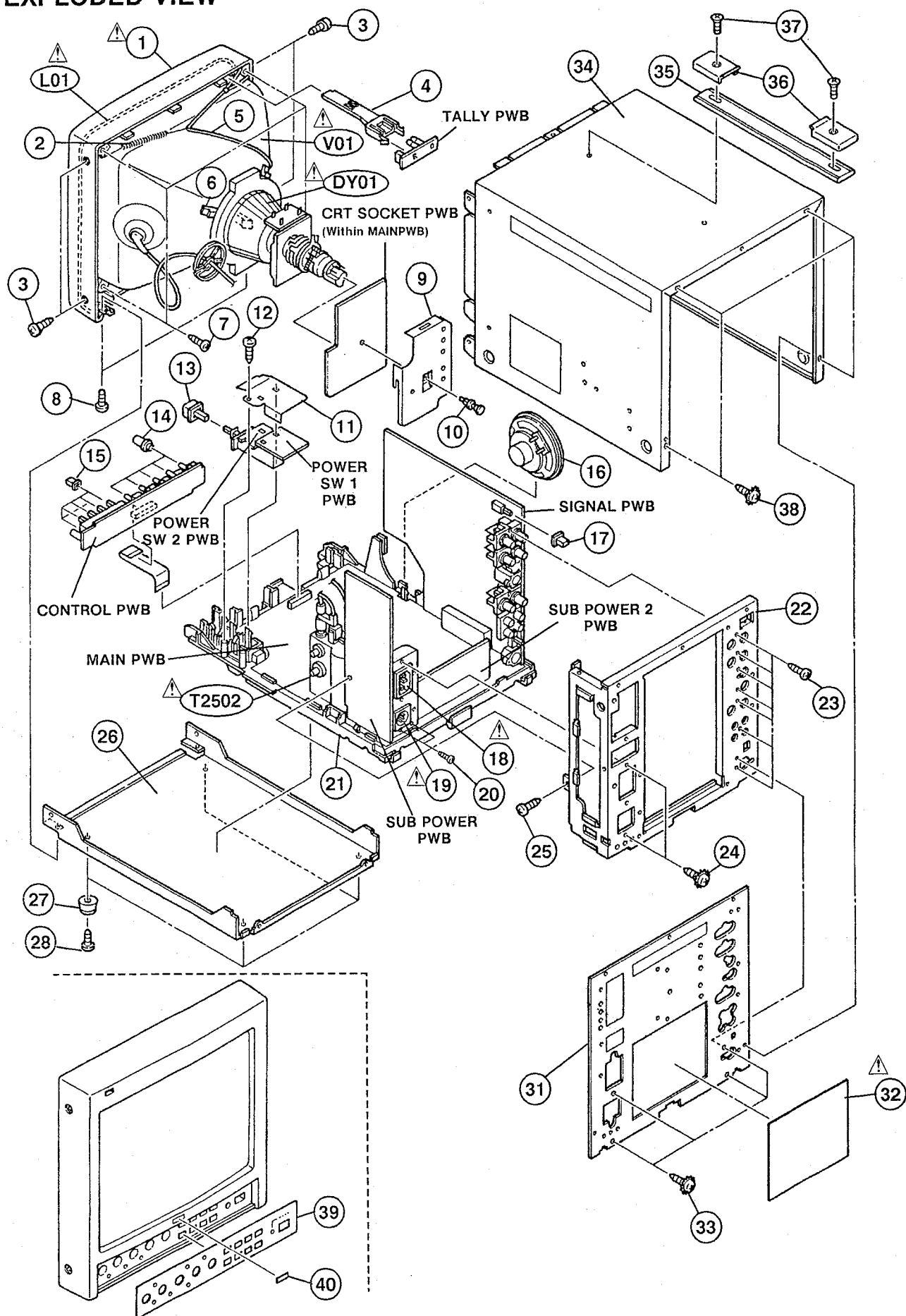
47 $\mu$ F =  $47 \times 10^6 \rightarrow$  476

Symbol	Shape
1	Straight lead
1	Leads in the same direction
8	Chip
A	Leads in the same direction (compact part)

## EXPLODED VIEW PARTS LIST

△ Ref.No.	Part No.	Part Name	Description	Local
△ L01	CELD046-001J1	DEGAUSSING COIL		
△ V01	A22JWG098X	PICTURE TUBE(C)		
△ DY01	CE20300-00A	DEFLECTION YOKE		
△ T2502	CJ28347-00B	HV TRANSF.		
△ 1	CM12867-C01-V0	FRONT PANEL		
2	CM48174-001	SPRING		
3	SDSF3006M	SCREW	(×4)	
4	CM36546-A01	TALLY LENS		
5	CHGB0016-0G-N	BRAIDED WIRE		
6	CE40666-00A	WEDGE	(×3)	
7	GBSF4016M	TAPPING SCREW	(×4)	
8	GBSG3008Z	TAPPING SCREW	(×2)	
9	CM36519-001	GUARD SHEET		
10	CM45627-00A	RIVET		
11	CM48246-001	PW SW SHEET		
12	SBSF4012Z	TAPPING SCREW		
13	CM46115-C01	POWER KNOB		
14	CM47853-002	VOLUME KNOB	(×5)	
15	CM46044-001	PUSH KNOB	(×8)	
16	CEBSS08P-01KJ2	SPEAKER	SP01	
17	CM46044-001	PUSH KNOB		
△ 18	QMCB006-C01	AC INLET	J9901(With in SUB POWER PWB)	
△ 19	CEMR007-A0B	CANNON PLUG ASSY	(DC INLET)	
20	SPST2606N	TH.TAP.SCREW	(×2)	
21	CM12868-A01-V0	CHASSIS BASE		
22	CM12869-001	TERMINAL BKT		
23	SBSB3010M	TAPPING SCREW	(×7)	
24	CM44287-00C	ASSY SCREW	(×2)	
25	SBSF4012Z	TAPPING SCREW		
26	CM22942-C01	BOTTOM COVER		
27	QZF2207-001	FOOT	(×4)	
28	GBSG3008Z	TAPPING SCREW	(×4)	
31	CM23130-A0A	REAR PANEL		
△ 32	CM22867-A27(R)	ROLL R LABEL		
33	CM44287-00C	ASSY SCREW	(×4)	
34	CM12879-00A	TOP COVER ASSY		
35	PU46361-2	HANDLE		
36	PRD43812	HANDLE COVER	(×2)	
37	SHSP4014R	SCREW	(×2)	
38	CM44287-00C	ASSY SCREW	(×4)	
39	CM23089-A01	CONTROL SHEET		
40	CM48149-A01	JVC MARK		

# EXPLODED VIEW



## PRINTED WIRING BOARD PARTS LIST

SIGNAL PW BOARD ASS'Y (FX-1089A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R1206	QVPC611-102HZ	V R(COMB A.D.J)	1kΩ B	
R1344	QVPC611-202HZ	V R(DL AMP)	2kΩ B	
RESISTOR				
R1616	QRD12CJ-271SX	C R	270 Ω 1/2W	J
△ R1620	QRD14CJ-470SX	C R	47 Ω 1/4W	J
CAPACITOR				
C1003	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1005	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1007	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1009	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1102	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1104	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1107	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1109	NCT03CH-470AY	CHIP CAP.	47 pF 50V	J
C1011	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1013	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1015	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1201	NCT03CH-680AY	CHIP CAP.	68 pF 50V	J
C1203	QEN61HM-105Z	BP E CAP.	1 μF 50V	M
C1204	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1205	QEN61CM-476Z	BP E CAP.	47 μF 16V	M
C1206	NCT03CH-560AY	CHIP CAP.	56 pF 50V	J
C1207	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1210	QEN61CM-476Z	BP E CAP.	47 μF 16V	M
C1212	NCT03CH-470AY	CHIP CAP.	47 pF 50V	J
C1214	NCT03CH-102AY	CHIP CAP.	1000 pF 50V	J
C1216-17	QEN61CM-476Z	BP E CAP.	47 μF 16V	M
C1219	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1221	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1223-24	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1225	NCT03CH-390AY	CHIP CAP.	39 pF 50V	J
C1226	QAT3110-450A	TRIM.CAP.	45 pF 100V	
C1227	NCT03CH-561AY	CHIP CAP.	560 pF 50V	J
C1228-29	NCT03CH-181AY	CHIP CAP.	180 pF 50V	J
C1231	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1233	NCT03CH-560AY	CHIP CAP.	5 pF 50V	J
C1234	QFV71HJ-684MZ	TF CAP.	0.68 μF 50V	J
C1301	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1302	NCT03CH-221AY	CHIP CAP.	220 pF 50V	J
C1303	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V	J
C1305-09	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1311	NCT03CH-101AY	CHIP CAP.	100 pF 50V	J
C1312-14	QAT3110-450A	TRIM.CAP.	45 pF 100V	
C1315	NCT03CH-101AY	CHIP CAP.	100 pF 50V	J
C1316	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1317	NCT03CH-221AY	CHIP CAP.	220 pF 50V	J
C1318	NCB21HK-223AY	CHIP CAP.	0.022 μF 50V	K
C1319	NCT03CH-101AY	CHIP CAP.	100 pF 50V	J
C1321-23	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1324	QEN61CM-106Z	BP E CAP.	10 μF 16V	M
C1325	NCB21HK-153AY	CHIP CAP.	0.015 μF 50V	K
C1327	QAT3110-450A	TRIM.CAP.	45 pF 100V	
C1328	NCT03CH-220AY	CHIP CAP.	22 pF 50V	J
C1329	QAT3110-450A	TRIM.CAP.	45 pF 100V	
C1330	NCT03CH-220AY	CHIP CAP.	22 pF 50V	J
C1331	NCT03CH-470AY	CHIP CAP.	47 pF 50V	J
C1332	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K
C1335	NCT03CH-561AY	CHIP CAP.	560 pF 50V	J
C1337	NCB21HK-103AY	CHIP CAP.	0.01 μF 50V	K

△ Symbol No.	Part No.	Part Name	Description	Local
CAPACITOR				
C1338	NCT03CH-220AY	CHIP CAP.	22 p F 50V	J
C1339	NCB21HK-103AY	CHIP CAP.	0.01 $\mu$ F 50V	K
C1340-43	NCT03CH-390AY	CHIP CAP.	39 p F 50V	J
C1344	NCT03CH-151AY	CHIP CAP.	150 p F 50V	J
C1603-04	NCT03CH-390AY	CHIP CAP.	39 p F 50V	J
C1605-06	NCT03CH-181AY	CHIP CAP.	181 p F 50V	J
C1610	NCT03CH-102AY	CHIP CAP.	1000 p F 50V	J
C1613	QEHCIEM-108MZ	E CAP.	1000 $\mu$ F 25V	M
C1615-16	NCS21HJ-391AY	CER CAP.-M	390 p F 50V	J
C1617	NCB21HK-473AY	CHIP CAP.	0.047 $\mu$ F 50V	K
C1803	NCB21HK-102AY	CHIP CAP.	1000 p F 50V	K
C1802	NCT03CH-181AY	CHIP CAP.	181 p F 50V	J
C1805	NCT03CH-181AY	CHIP CAP.	180 p F 50V	J
C1807	QFV71HJ-334MZ	TF CAP.	0.33 $\mu$ F 50V	J
C1809	NCB21HK-472AY	CHIP CAP.	4700 p F 50V	K
C1810	NCB21HK-102AY	CHIP CAP.	1000 p F 50V	K
C1811	NCT03CH-221AY	CHIP CAP.	220 p F 50V	J
C1812	NCT03CH-102AY	CHIP CAP.	1000 p F 50V	J
C1813	NCB21HK-153AY	CHIP CAP.	0.015 $\mu$ F 50V	K
C1814	NCB21HK-222AY	CHIP CAP.	2200 p F 50V	K
C1815	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1816	NCT03CH-470AY	CHIP CAP.	47 p F 50V	J
C1817	NCT03CH-390AY	CHIP CAP.	39 p F 50V	J
C1818	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1819	QEN61CM-476Z	BP E CAP.	47 $\mu$ F 16V	M
C1820	NCT03CH-560AY	CHIP CAP.	56 p F 50V	J
C1821	NCT03CH-101AY	CHIP CAP.	100 p F 50V	J
C1822	NCB21HK-562AY	CHIP CAP.	5600 p F 50V	K
TRANSFORMER				
T1301	CELTO34-001	B.PASS TRANSF.		
T1302	CELTO34-002	B.PASS TRANSF.		
T1303	CE40176-001	DL P.TRANSF.		
COIL				
L1201	CELP026-270Z	PEAKING COIL	27 $\mu$ H	
L1202	CELP026-101Z	PEAKING COIL	100 $\mu$ H	
L1203	CELP026-220Z	PEAKING COIL	22 $\mu$ H	
L1204	CELP026-180Z	PEAKING COIL	18 $\mu$ H	
L1301	CELP026-180Z	PEAKING COIL	18 $\mu$ H	
L1302-03	CELP026-8R2Z	PEAKING COIL	8.2 $\mu$ H	
L1304	CELP026-390Z	PEAKING COIL	39 $\mu$ H	
L1305	CELP026-4R7Z	PEAKING COIL	4.7 $\mu$ H	
L1306-07	CELP026-221Z	PEAKING COIL	220 $\mu$ H	
L1308	CELP026-560Z	PEAKING COIL	56 $\mu$ H	
L1601	CELP026-4R7Z	PEAKING COIL	4.7 $\mu$ H	
DIODE				
D1001-19	1SS353-X	SI.DIODE		
D1022-28	1SS353-X	SI.DIODE		
D1031	1SS133-T2	SI.DIODE		
D1101-04	1SS353-X	SI.DIODE		
D1201-02	1SS353-X	SI.DIODE		
D1204-05	1SS353-X	SI.DIODE		
D1208	MA3056(H)-X	ZENER DIODE		
D1301-08	1SS353-X	SI.DIODE		
D1310	MA3091(M)-X	ZENER DIODE		
D1601	MA3150(M)-X	ZENER DIODE		
D1801-03	1SS353-X	SI.DIODE		
TRANSISTOR				
Q1001	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1005	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1006-07	DTC144EKA-X	DIGI.TRANSISTOR		
Q1008	2SA1037K(QR)-X	SI.TRANSISTOR		
Q1009	2SC2412K(QR)-X	SI.TRANSISTOR		
Q1010	2SA1037K(QR)-X	SI.TRANSISTOR		



△ Symbol No.	Part No.	Part Name	Description	Local
TRANSISTOR				
Q1011-12	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1013	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1014-16	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1017	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1018-20	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1021	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1022-23	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1101-04	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1201-04	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1024-25	DTC144EKA-X	DIGI. TRANSISTOR		
Q1209	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1205	DTC144EKA-X	DIGI. TRANSISTOR		
Q1206	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1207	DTC144EKA-X	DIGI. TRANSISTOR		
Q1208	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1210	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1211	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1212-20	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1222-25	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1301-02	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1304-07	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1310-13	DTC144EKA-X	DIGI. TRANSISTOR		
Q1314-15	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1316	DTC144EKA-X	DIGI. TRANSISTOR		
Q1320-21	DTC144EKA-X	DIGI. TRANSISTOR		
Q1601-02	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1603	DTC144EKA-X	DIGI. TRANSISTOR		
Q1801	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1802	DTC144EKA-X	DIGI. TRANSISTOR		
Q1803-04	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1805-06	2SA1037K(QR)-X	SI. TRANSISTOR		
Q1807-10	2SC2412K(QR)-X	SI. TRANSISTOR		
Q1811	DTC144EKA-X	DIGI. TRANSISTOR		
I C				
IC1101	LA7016	I.C. (MONO-ANA)		
IC1201-02	TC4066BF-W	I.C. (DIGI-MOS)		
IC1203	AN5613	I.C. (MONO-ANA)		
IC1301-02	TC4066BF-W	I.C. (DIGI-MOS)		
IC1303	AN5625N	I.C. (MONO-ANA)		
IC1601	TC4066BF-W	I.C. (DIGI-MOS)		
IC1602	AN5265	I.C. (MONO-ANA)		
IC1801	TC4066BF-W	I.C. (DIGI-MOS)		
IC1802	TC4538BF-W	I.C. (DIGI-MOS)		
IC1803	TC4066BF-W	I.C. (DIGI-MOS)		
IC1804-07	TC4538BF-W	I.C. (DIGI-MOS)		
OTHERS				
DL1201	CE42099-003	DELAY LINE		
DL1301	CE40907-B01	DELAY LINE(1H)		
DL1302	CE41489-001	DELAY LINE(1H)		
J1001	QMCC503-C01	DIN JACK	(TALLY/REMOTE)	
J1101	CEMB021-001	BNC CONNECTOR	(VIDEO A)	
J1102	CEMB021-001	BNC CONNECTOR	(VIDEO B)	
J1201	QMCC004-C01	MINI DIN JACK	(Y/C IN)	
J1202	QMD2B04-001	MINI CONNECTOR	(Y/C OUT)	
J1601	CEMN036-005	PIN JACK	(AUDIO)	
J1801	CEMB021-001	BNC CONNECTOR	(EXT SYNC)	
S1001	QSS1F22-C07	SLIDE SWITCH	(AFC)	
S1201	QSTQ101-C02	PUSH SWITCH	(SET UP)	
S1301	QSL4A13-C03Z	LEVER SWITCH	(APC SW1)	
S1302	QSL4A13-C03Z	LEVER SWITCH	(APC SW2)	
TH001	ERT-D2ZHL503S	THERMISTOR		
X1301	CE40749-001Z	CRYSTAL		
X1302	CE40668-001Z	CRYSTAL		

## MAIN, CRT SOCKET PW BOARD ASS'Y (FX-2050A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R2303	QVPE805-103H	V R(R CUT OFF)	10k Ω B	
R2306	QVPE805-201H	V R(R DRIVE)	200 Ω B	
R2313	QVPE805-103H	V R(G CUT OFF)	10k Ω B	
R2316	QVPE805-201H	V R(G DRIVE)	200 Ω B	
R2323	QVPE805-103H	V R(B CUT OFF)	10k Ω B	
R2415	QVPC611-501HZ	V R(V.LIN)	500 Ω B	
R2417	QVPC611-501HZ	V R(V.SIZE)	500 Ω B	
R2420	QVPC611-102HZ	V R(V.SIZE UNDER)	1k Ω B	
R2427	QVPC611-501HZ	V R(V.CENT)	500 Ω B	
R2510	QVPC611-502HZ	V R(H.HOLD)	5k Ω B	
R2514	QVPC611-103HZ	V R(H.POSI)	10k Ω B	
RESISTOR				
R2304	QRG029J-822A	OM R	8.2k Ω 2W	J
R2314	QRG029J-822A	OM R	8.2k Ω 2W	J
R2324	QRG029J-822A	OM R	8.2k Ω 2W	J
R2421	QRX019J-4R7S	MF R	4.7 Ω 1W	J
△ R2516	QRV141F-2701AY	MF R	2.7k Ω 1/4W	F
△ R2517	QRV141F-6801AY	MF R	6.8k Ω 1/4W	F
△ R2518	QRZ0054-4R7M	F R	4.7 Ω 1/4W	J
△ R2519	QRH017J-150M	F R	15 Ω 1W	J
△ R2521	QRH017J-3R3M	F R	3.3 Ω 1W	J
△ R2529	QRZ0054-2R2M	F R	2.2 Ω 1/4W	J
R2530	QRX019J-5R6S	MF R	5.6 Ω 1W	J
R2531	QRG029J-331	OM R	330 Ω 2W	J
R2532	QRG019J-122S	OM R	1.2k Ω 1W	J
R2533	QRG019J-681S	OM R	680 Ω 1W	J
R2902	QRF074K-3R3	UNF R	3.3 Ω 7W	K
R2903	QRG039J-223A	OM R	22k Ω 3W	J
R2906	QRG029J-473	OM R	47k Ω 2W	J
R2909	QRM059J-R33	MP R	0.33 Ω 9W	J
△ R2911	QRZ0054-4R7M	F R	4.7 Ω 1/4W	J
R2932	QRX019J-1R0S	MF R	1 Ω 1W	J
△ R2961	QRZ0054-180M	F R	18 Ω 1/4W	J
R2968	QRG029J-471A	OM R	470 Ω 2W	J
R2973	QRG029J-681A	OM R	680 Ω 2W	J
△ R2977	QRZ0054-2R2M	F R	2.2 Ω 1/4W	J
△ R2978	QRZ0057-825	C R	8.2M Ω 1W	J
CAPACITOR				
C2306	QEHC2EM-105MZ	E CAP.	1 μ F 250V	M
C2307	QCZ0121-102M	C CAP.	1000 p F 3000V	P
C2309	QEHC2EM-475MZ	E CAP.	4.7 μ F 250V	M
C2310	QEHC1CM-107MZ	E CAP.	100 μ F 16V	M
C2402	QFLC1HJ-103MZ	M CAP.	0.01 μ F 50V	J
C2404	QFLC1HJ-682MZ	M CAP.	6800 p F 50V	J
C2407	QEE61VK-105BZ	TAN.CAP.	1 μ F 35V	K
C2408	QFLC1HJ-223MZ	M CAP.	0.022 μ F 50V	J
C2409-10	QFLC1HJ-103MZ	M CAP.	0.01 μ F 50V	J
C2414	QFLC1HJ-223MZ	M CAP.	0.022 μ F 50V	J
C2502	QFLC1HJ-563MZ	M CAP.	0.056 μ F 50V	J
C2503	QFLC1HJ-682MZ	M CAP.	6800 p F 50V	J
C2505	QFP31HJ-332SZ	PP CAP.	3300 p F 50V	J
C2506	QFLC1HJ-222MZ	M CAP.	2200 p F 50V	J
C2508	QFV71HJ-474MZ	TF CAP.	0.47 μ F 50V	J
C2510	QFLC1HJ-123MZ	M CAP.	0.012 μ F 50V	J
C2512	QFLC1HJ-393MZ	M CAP.	0.039 μ F 50V	J
C2513	QFLC1HJ-152MZ	M CAP.	1500 p F 50V	J
C2515	QETC1VM-107Z	E CAP.	100 μ F 35V	M
C2519	QETC1VM-108Z	E CAP.	1000 μ F 35V	M
C2520	QFV71HJ-124MZ	TF CAP.	0.12 μ F 50V	J
C2525	QFLC1HJ-473MZ	M CAP.	0.047 μ F 50V	J
C2527	QFLC2AK-472MZ	M CAP.	4700 p F 100V	K
C2528	QFLC2AK-822MZ	M CAP.	8200 p F 100V	K

△ Symbol No.	Part No.	Part Name	Description	Local
<b>C A P A C I T O R</b>				
△ C2530	QFZ0117-3801S	MPP CAP.	3800 p F 1.4kVH ± 2.5%	
C2532	QFLC2AK-563MZ	M CAP.	0.056 μ F 100V	K
C2533	QETC2EM-106Z	E CAP.	10 μ F 250V	M
C2534	QFZ0119-224S	MPP CAP.	0.22 μ F 200V	± 3%
△ C2907	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2908	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2909	QCZ9034-472A	C CAP.	4700 p FAC400V	P
△ C2910	QCZ9034-472A	C CAP.	4700 p FAC400V	P
C2911	QEZ0199-227R	E CAP.	220 μ F 200V	P
C2912	QCF22HP-103M	CH C CAP.	0.01 μ F 500V	P
C2913	QCZ0122-271U	C CAP.	270 p F 2000V	K
C2916	QCZ0122-151U	C CAP.	150 p F 2000V	K
C2934	QCZ0122-561A	C CAP.	560 p F 2000V	K
C2936	QEZ0203-107	E CAP.	100 μ F 160V	
C2938	QFM72DK-473M	M CAP.	0.047 μ F 200V	K
C2940	QEZ0203-107	E CAP.	100 μ F 160V	
C2959	QFV71HJ-224MZ	TF CAP.	0.22 μ F 50V	J
C2965	QEM51EM-337M	E CAP.	330 μ F 25V	M
C2968	QFLC1HJ-472MZ	M CAP.	4700 p F 50V	J
<b>T R A N S F O R M E R</b>				
△ T2501	CE41106-00C	DRIVE TRANSF.		
△ T2502	CJ28347-00B	HV TRANSF.		
△ T2901	CETS034-001J2	SWITCH TRANSF.		
T2951	A76567-MA	P.DRIVE TRANSF.		
T2952	CETS072-001	SW REACTOR		
<b>C O I L</b>				
L2301-03	CELP026-271Z	PEAKING COIL	270 μ H	
△ L2501	CE40140-00F	WIDTH COIL		
△ L2502	CELL016-001	LINEARITY COIL		
L2931	CELC058-820Z	CHOKE COIL		
<b>D I O D E</b>				
D2305	RGP10J(C1)-T3	SI.DIODE		
D2401	1SS133-T2	SI.DIODE		
D2402	MA4051(M)-T2	ZENER DIODE		
D2403	1SR35-100A-T2	SI.DIODE		
D2404	1SS133-T2	SI.DIODE		
△ D2501	MA4068(N)C1-T2	ZENER DIODE		
D2502	1SS81-T2	SI.DIODE		
D2503-04	RGP10J(C1)-T3	SI.DIODE		
D2505	RU30-C1	SI.DIODE		
D2506	RK14-T3	SI.DIODE		
D2507	RD11ES(B3)-T2	SI.DIODE		
D2508	RGP10J(C1)-T3	SI.DIODE		
D2509	ERD07-15-L	SI.DIODE		
D2510	RU2-T3	SI.DIODE		
D2511	RH1S-T3	SI.DIODE		
D2512	1SS133-T2	SI.DIODE		
D2513	1SR124-400A-T2	SI.DIODE		
△ D2901	S1VBA60	BRIDGE DIODE		
D2902	RU1C-LFC4	SI.DIODE		
D2905	AU01Z-T2	SI.DIODE		
D2931	RGP10J(C1)-T3	SI.DIODE		
D2932	RU3AM-LFC4	SI.DIODE		
D2933	MA4180(M)-T2	ZENER DIODE		
D2935	MA4051(M)-T2	ZENER DIODE		
D2936	1SS133-T2	SI.DIODE		
D2951	1SR35-100A-T2	SI.DIODE		
D2952	1SS146-T2	SI.DIODE		
D2958	1SR35-100A-T2	SI.DIODE		
D2962	RGP10J(C1)-T3	SI.DIODE		
D2963	RD39E(B3)-T5	SI.DIODE		
D2964	FML-G14S	SI.DIODE		
D2965	1SS133-T2	SI.DIODE		
<b>T R A N S I S T O R</b>				
Q2301-03	2SC2611	SI.TRANSISTOR		

△ Symbol No.	Part No.	Part Name	Description	Local
T R A N S I S T O R				
Q2401	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2402	2SD1853-T	SI. TRANSISTOR		
Q2403	DTC124ES-T	DIGI. TRANSISTOR		
Q2501	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2502	DTC124ES-T	DIGI. TRANSISTOR		
Q2503	2SC2655(Y)-T	SI. TRANSISTOR		
△ Q2504	2SD1878-YD	SI. TRANSISTOR	H.OUT	
Q2505	IRF620	F.E.T.		
Q2506	2SC2482(C1)-T	SI. TRANSISTOR		
△ Q2901	IRFIBC40G	F.E.T.		
Q2931	2SA949(Y)C1	SI. TRANSISTOR		
Q2932	DTC124ESA-T	DIGI. TRANSISTOR		
Q2933	DTC124ES-T	DIGI. TRANSISTOR		
Q2934	2SC3311A(QR)-T	SI. TRANSISTOR		
Q2935	2SA1309A(QR)-T	SI. TRANSISTOR		
Q2953	2SC1627A(Y)-T	SI. TRANSISTOR		
Q2954	2SC2750(L)	SI. TRANSISTOR		
I C				
IC2401	LA7830	I.C.(MONO-ANA)		
IC2402	TC4052BP	I.C.(DIGI-MOS)		
IC2501	HA11423	I.C.(MONO-ANA)		
IC2502	AN7812F	I.C.(MONO-ANA)		
△ IC2931	S1854-C1	I.C.(MONO-ANA)		
IC2952	TA78012AP	I.C.(MONO-ANA)		
O T H E R S				
△ CP2931	ICP-N38-Y	I.C.PROTECT		
△ F2951	QMF51E2-4R0S	FUSE	4.0A	
K2401-02	CE41433-001Z	BEADS CORE		
K2901	CE42050-001Z	CORE		
K2903	CE42050-001Z	CORE		
K2904	CE41433-001Z	BEADS CORE		
K2931	CE42050-001Z	CORE		
K2933	CE42050-001Z	CORE		
△ PC2901	CNY17F-C1	I.C.(PH.COUPLER)		
△ RY2951	CESK028-001	RELAY		
S2501	QSL4A13-C03Z	LEVER SWITCH	(H.SYNC SW)	
S2502	QSL4A13-C03Z	LEVER SWITCH	(H.CENT SW)	
△ SK2001	CE42554-001	C.R.T.SOCKET		
△ TH2901	CEKP003-001	P.THERMISTOR		

## CONTROL PW BOARD ASS'Y (FX-4044A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R4002	QVGA004-CB14A	V R(VOLUME)	10kΩ B	
R4006	QVPC611-103HZ	V R(SUB PHASE)	10kΩ B	
R4007	QVGA003-CB14A	V R(PHASE)	10kΩ B	
R4010	QVGA003-CB14A	V R(CHAROMA)	10kΩ B	
R4012	QVPC611-103HZ	V R(SUB CHROMA PAL)	10kΩ B	
R4015	QVPC611-103HZ	V R(SUB CHROMA NTSC)	10kΩ B	
R4020	QVGA003-CB14A	V R(BRIGHT)	10kΩ B	
R4022	QVPC611-103HZ	V R(SUB BRIGHT)	10kΩ B	
R4025	QVGA003-CB14A	V R(CONTRAST)	10kΩ B	
R4026	QVPC611-103HZ	V R(SUB CONT)	10kΩ B	
R4029	QVPC611-502HZ	V R(V.HOLD)	5kΩ B	
CAPACITOR				
C4001	QER51CM-226M	E CAP.	22 μF 16V M	
C4002	QFV71HJ-104MZ	TF CAP.	0.1 μF 50V J	
DIODE				
D4001	SML1216W	L.E.D.	(POWER LED)	
TRANSISTOR				
Q4001-03	DTC144EKA-X	DIGI.TRANSISTOR		
OTHERS				
	CM46942-A01	LED HOLDER		
S4001	QSW0379-001	PUSH SWITCH(UNDER SCAN,PULSE CROSS,COLOR OFF,BULE CHECK)		
S4002	QSW0379-001	PUSH SWITCH(INPUT A/B,EXT SYNC,NTSC/PAL,4:3/16:9)		

## TALLY PW BOARD ASS'Y (FX-4045A)

△ Symbol No.	Part No.	Part Name	Description	Local
DIODE				
D4002-03	SLR-56DC3F	L.E.D.(ORG)	(TALLY LAMP)	
OTHERS				
	CM48038-001	L.E.D.HOLDER		

## SUB POWER PW BOARD ASS'Y (FX-9048A)

△ Symbol No.	Part No.	Part Name	Description	Local
CAPACITOR				
△ C9901	QFZ9036-473M	MF CAP.	0.047 μF AC250V	M
△ C9902	QFZ9036-473M	MF CAP.	0.047 μF AC250V	M
△ C9904	QCZ9033-472A	C CAP.	4700 pF AC400V	M
△ C9905	QCZ9033-472A	C CAP.	4700 pF AC400V	M
△ C9906	QCZ9033-472A	C CAP.	4700 pF AC400V	M
OTHERS				
△ F9901	QMF51E2-4R0S	FUSE	4.0A	
△ J9901	QMCB006-C01	AC INLET		
△ LF9901	CELF006-001J1	LINE FILTER		
△ VA9901	ERZV10V621CS	VARISTOR		

## SUB POWER 2 PW BOARD ASS'Y (FX-9054A)

△ Symbol No.	Part No.	Part Name	Description	Local
VARIABLE RESISTOR				
R9958	QVPC611-203HZ	V R(BATT PROT)	20kΩ B	
R9974	QVPC611-202HZ	V R(B1 ADJ)	2kΩ B	
RESISTOR				
△ R9972	QRV141F-6801AY	MF R	6.8kΩ 1/4W	F
△ R9975	QRV141F-1503AY	MF R	150kΩ 1/4W	F
CAPACITOR				
C9917	QFLC1HJ-562MZ	M CAP.	5600 p F 50V	J
C9920	QFLC1HJ-272MZ	M CAP.	2700 p F 50V	J
C9921	QFLC1HJ-332MZ	M CAP.	3300 p F 50V	J
C9926	QFLC1HJ-122MZ	M CAP.	1200 p F 50V	J
C9953	QETC1VM-106Z	E CAP.	10 μ F 35V	M
C9956	QFV71HJ-474MZ	TF CAP.	0.47 μ F 50V	J
C9957	QFLC1HJ-123MZ	M CAP.	0.012 μ F 50V	J
C9963	QFV71HJ-105MZ	TF CAP.	1 μ F 50V	J
C9969	QFLC1HJ-562MZ	M CAP.	5600 p F 50V	J
DIODE				
D9903	1SS81-T2	SI DIODE		
D9904	MA4150(M)-T2	ZENER DIODE		
D9907	MA4150(M)-T2	ZENER DIODE		
D9953-55	1SS133-T2	SI DIODE		
D9957	MA4051(M)-T2	ZENER DIODE		
D9959-60	1SS133-T2	SI DIODE		
D9961	MA4051(M)-T2	ZENER DIODE		
TRANSISTOR				
Q9902	2SC3311A(QR)-T	SI TRANSISTOR		
Q9951-52	2SC3311A(QR)-T	SI TRANSISTOR		
I C				
IC9901	AN8026	I.C.(MONO-ANA)		
IC9951	AN5900	I.C.(MONO-ANA)		
IC9953	UPC4558C	I.C.(MONO-ANA)		

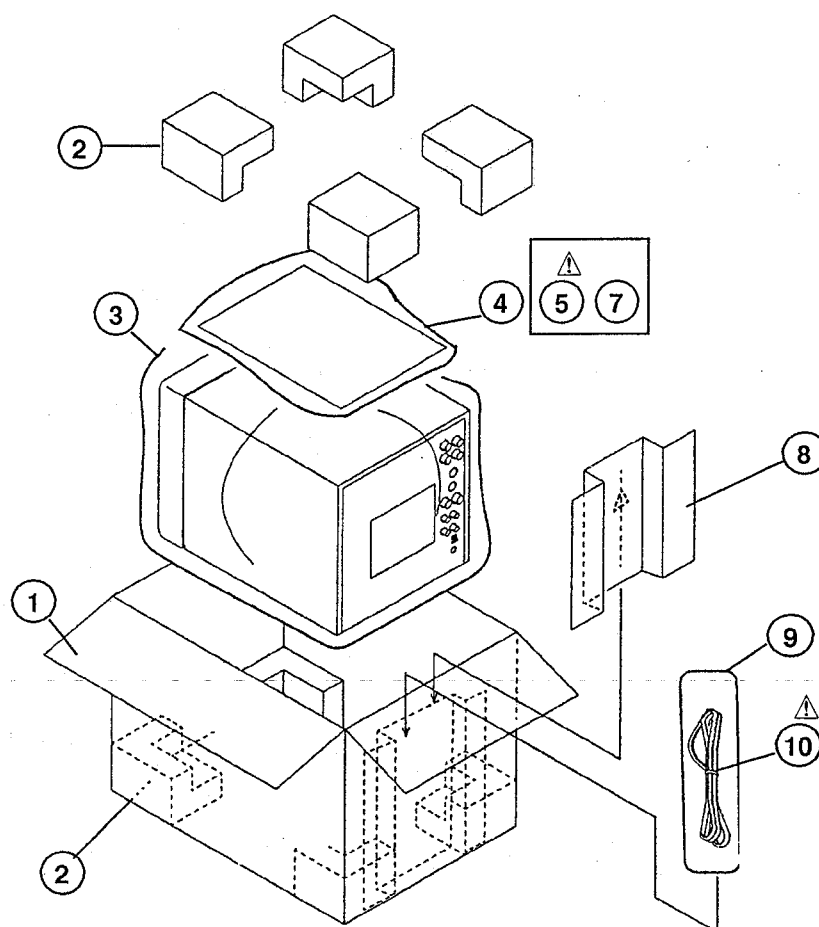
## POWER SW 1 PW BOARD ASS'Y (FX-9051A)

△ Symbol No.	Part No.	Part Name	Description	Local
OTHERS				
△ S9901	QSW0380-001	PUSH SWITCH	(POWER SW)	

## POWER SW 2 PW BOARD ASS'Y (FX-9052A)

This PWB ASS'Y has no part to be supplied.

# PACKING




## PACKING PARTS LIST

⚠ Ref.No.	Part No.	Part Name	Description	Local
1	CP11224-A40	PACKING CASE		
2	CP11460-B0A	CUSHION ASSY	8pcs in 1set	
3	CP30974-003	POLY BAG		
4	CP30975-001	POLY BAG		
⚠ 5	CQ40285-A01	INST.BOOK		
7	CM23095-001	X-RAY CARD		
8	CP40339-001	PW CORD HOLDER		
9	QPGA012-03005	POLY BAG		
⚠ 10	QMP49082-200K	POWER CORD		

# TM-1010PN STANDARD CIRCUIT DIAGRAM

## ■ NOTE ON USING CIRCUIT DIAGRAMS

### 1. SAFETY

The components identified by the  symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

### 2. SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

- |   |   |
|---|---|
| (1) Input signal  | : Colour bar signal   |
| (2) Setting positions<br>of each knob/button<br>and variable resistor | : Original setting position<br>when shipped   |
| (3) Internal resistance of tester                                     | : DC 20k $\Omega$ /V  |
| (4) Oscilloscope sweeping time  | : H $\Rightarrow$ 20 $\mu$ S/div<br>: V $\Rightarrow$ 5mS/div<br>: Others $\Rightarrow$ Sweeping time is<br>specified |
| (5) Voltage values  | : All DC voltage values   |
- \* Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

### 3. INDICATION OF PARTS SYMBOL [EXAMPLE]

- In the PW board : R1209  $\rightarrow$  R209

### 4. INDICATIONS ON THE CIRCUIT DIAGRAM

#### (1) Resistors

##### • Resistance value

- No unit : [ $\Omega$ ]
- K : [K $\Omega$ ]
- M : [M $\Omega$ ]

##### • Rated allowable power

- No indication : 1/6[W]
- Others : As specified

##### • Type

- No indication : Carbon resistor
- OMR : Oxide metal film resistor
- MFR : Metal film resistor
- MPR : Metal plate resistor
- UNFR : Uninflammable resistor
- FR : Fusible resistor

\* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

#### (2) Capacitors

##### • Capacitance value

- 1 or higher : [pF]
- less than 1 : [ $\mu$ F]

##### • Withstand voltage

- No indication : DC 50[V]
- Others : DC withstand voltage[V]
- AC indicated : AC withstand voltage[V]

##### \* Electrolytic Capacitors

- 47/50 [Example]: Capacitance value [ $\mu$ F]/withstand voltage[V]




##### • Type

- No indication : Ceramic capacitor
- MY : Mylar capacitor
- MM : Metalized mylar capacitor
- PP : Polypropylene capacitor
- MPP : Metalized polypropylene capacitor
- MF : Metalized film capacitor
- TF : Thin film capacitor
- BP : Bipolar electrolytic capacitor
- TAN : Tantalum capacitor

#### (3) Coils



- No unit : [ $\mu$ H]
- Others : As specified

#### (4) Power Supply




-  : B1
-  : B2(12V)
-  : 5V

\* Respective voltage values are indicated.





#### (5) Test Point

-  : Test point
-  : Only test point display



#### (6) Connecting method

-  : Connector
-  : Wrapping or soldering
-  : Receptacle

#### (7) Ground symbol

-  : LIVE side ground
-  : ISOLATED (NEUTRAL) side ground
-  : EARTH ground
-  : DIGITAL ground

## 5. NOTE FOR REPAIRING SERVICE

This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : () side GND and the ISOLATED (NEUTRAL) : () side GND. Therefore, care must be taken for the following points.

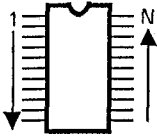
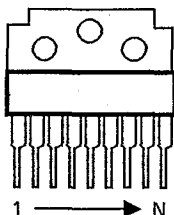
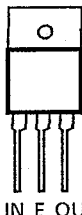
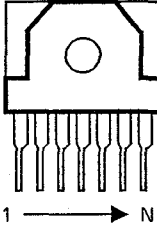
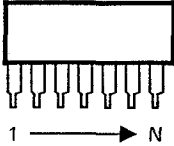
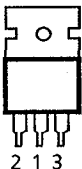
- (1) Do not touch the LIVE side GND or the LIVE side GND and the ISOLATED (NEUTRAL) side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
- (2) Do not short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or never measure with a measuring apparatus (oscilloscope, etc.) the LIVE side GND and ISOLATED (NEUTRAL) side GND at the same time. If the above precaution is not respected, a fuse or any parts will be broken.

◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.


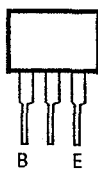
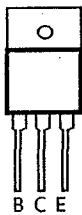
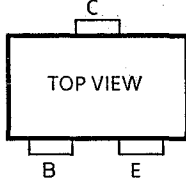
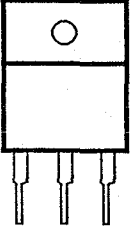


SEMICONDUCTOR SHAPES

ICs

 <p>AN5265 AN5613 HA11423 TC4538BF TC4052BP TC4066BF UPC4558C</p>	 <p>AN5265</p>	 <p>AN7812F</p> <p>IN E OUT</p>
 <p>LA7830</p>	 <p>LA7016 AN5900 AN8026</p>	 <p>S1854-C1 TA7012AP</p> <p>2 1 3</p>

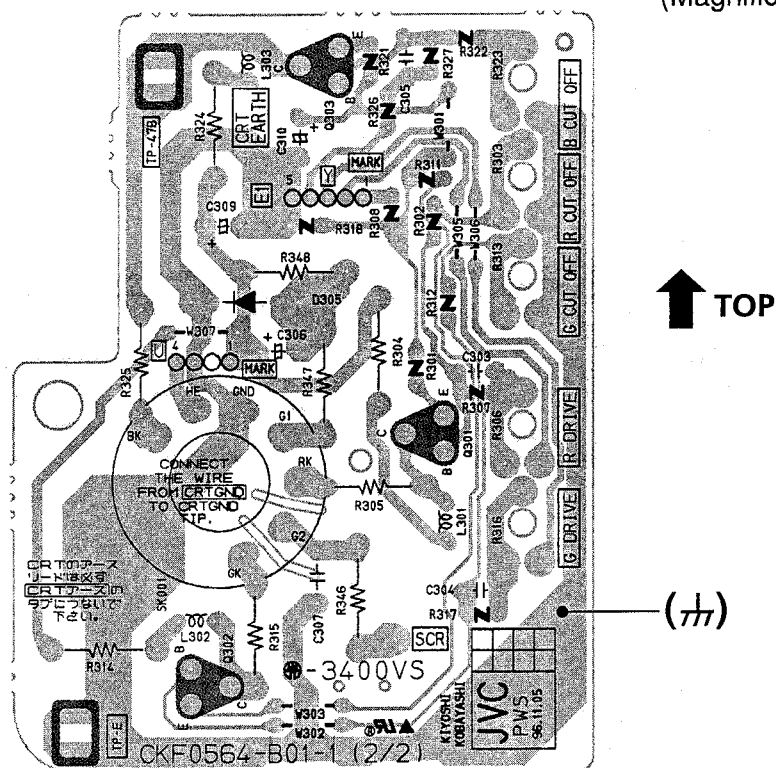
TRANSISTORS

<p>Bottom View</p>  <p>2SA1015(YG)-T 2SA1309 2SA1370(E) 2SA562TM 2SC1472K 2SC1815(YG)-T 2SC1959(Y) 2SC2655(Y)-T 2SC3187-T</p>	 <p>2SC1309A(QR) 2SC3311A(QR) DTC124ES-T DTC124ESA-T</p> <p>B E</p>	 <p>2SC2750(L)</p> <p>B C E</p>
<p>(Chip Transistor)</p>  <p>TOP VIEW</p> <p>2SA1037K(QR) 2SC2412K(QR) DTC144EKA</p> <p>B E</p>	 <p>IRFIBC40G IRF620 2SD1878-YD</p>	

## CRT SOCKET PWB PATTERN (With in MAIN PWB)

[FX-2050A]

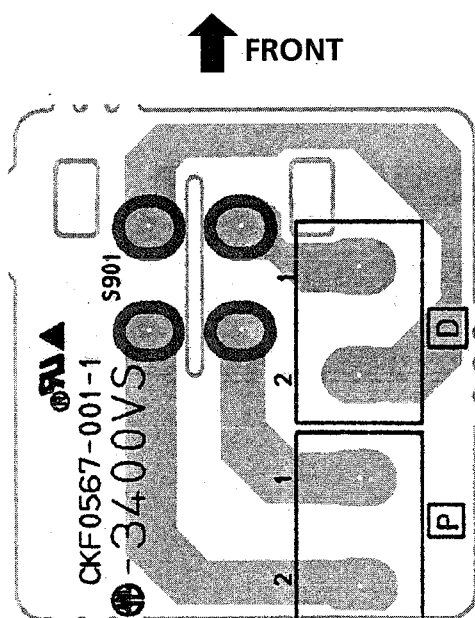
(Magnification Rate 95%)



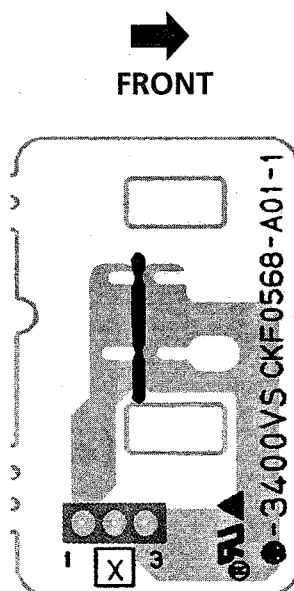
POWER SW1 PWB PATTERN (1)  
 POWER SW2 PWB PATTERN (2)  
 TALLY PWB PATTERN (3)

[FX-9051A]  
 [FX-9052A]  
 [FX-4045A]

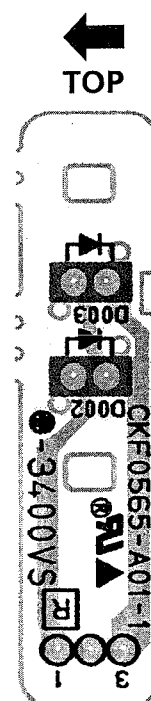
(Magnification Rate 170%)



(1)



(2)



(3)



# JVC

Manual Change Information

## SERVICE MANUAL

### COLOUR VIDEO MONITOR

# TM-1010PN

BASIC CHASSIS

B10

Since some details of the TM-1010PN service manual (No.51180, Jan. 1997) were incorrect, we are informing you of these errors and of the correct descriptions.

#### 1.CORRECTED ITEMS

SUB POWER PW BOARD PARTS LIST (FX-9048A) (Page 29)

SUB POWER PW BOARD CIRCUIT DIAGRAM (FX-9048A) (Page 2-9)

⚠	SYMBOL No.	PARTS No.		PARTS NAME	DESCRIPTION
		INCORRECT PARTS No.	CORRECT PARTS No.		
⚠	F9901 (F901)	QMF51E2-4R0S (4A)	QMF51E2-3R15J4 (3.15A)	FUSE	

MAIN, CRT SOCKET PW BOARD PARTS LIST (FX-2050A) (Page 28)

MAIN PW BOARD CIRCUIT DIAGRAM (FX-2050A) (Page 2-9)

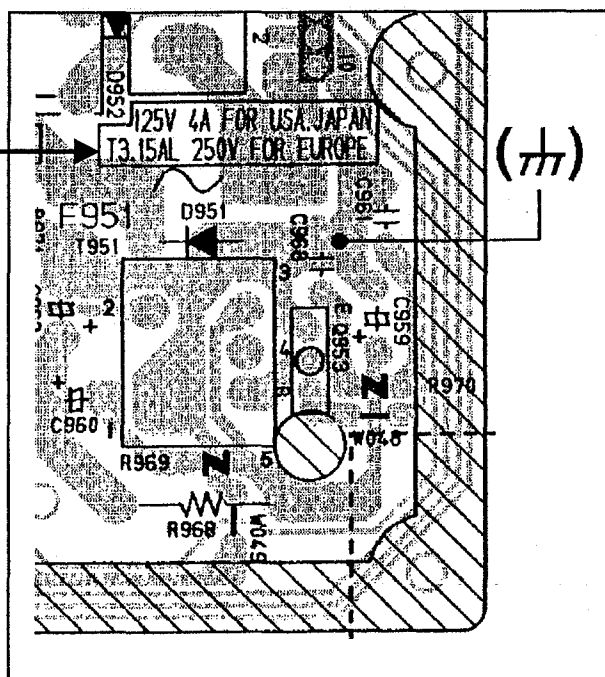
⚠	SYMBOL No.	PARTS No.		PARTS NAME	DESCRIPTION
		INCORRECT PARTS No.	CORRECT PARTS No.		
	Q2932 (Q932)	DTC124ESA-T	2SC2229(Y)-T	SI. TRANSISTOR	

# MAIN PW BOARD PATTERN (FX-2050A) (Page 2-14)

INCORRECT  
T3.15AL



CORRECT  
T4AL



# JVC

VICTOR COMPANY OF JAPAN, LIMITED

TELEVISION RECEIVER DIVISION 1106 Heta, Iwai-city, Ibaraki-prefecture, 306-06, Japan



**JVC**

Manual Change Information

**SERVICE MANUAL****COLOUR VIDEO MONITOR****TM-1010PN**

BASIC CHASSIS

**B10**

Since some details of the TM-1010PN service manual (No.51180, Jan. 1997) were incorrect, we are informing you of these errors and of the correct descriptions.

**CORRECTED ITEMS****1.EXPLODED VIEW PARTS LIST** ..... [page 21]

△ Ref.No.	Part No.	Part Name	Description	Local
31	CM23130-A0A	REAR PANEL		
△ 32	CM22867-A27(R)	ROLL R LABEL		
33	CM44287-00C	ASSY SCREW	(×4)	
34	GM12879-00A	TOP COVER ASSY		
35	PU46361-2	HANDLE		

**CORRECTION**CM12879-00B**2.PACKING PARTS LIST** ..... [page 31]

△ Ref.No.	Part No.	Part Name	Description	Local
△ 5	CQ40285-A01	INST.BOOK		
7	CM23095-001	X-RAY CARD		
8	CP40339-001	PW CORD HOLDER		
9	QPGA012-03005	POLY BAG		
△ 10	QMP49082-200K	POWER CORD		

**CORRECTION**QMP4908-200K**JVC**

VICTOR COMPANY OF JAPAN,LIMITED

TELEVISION RECEIVER DIVISION 1106 Heta,Iwai-city,Ibaraki-prefecture,306-06,Japan

TM-1010PN #3


 Printed in Jap:  
 NP9702  
 NP0314

**JVC**

Manual Change Information

**SERVICE MANUAL****COLOUR VIDEO MONITOR****TM-1010PN**

BASIC CHASSIS

**B10**

Since some details of the TM-1010PN service manual (No.51180, Jan. 1997) were changed, we are informing you of these changes and of the new descriptions.

**1.OUTLINE OF CHANGES**

The circuit has been changed as follows in order to accommodate the DVD copy guard.

**2.CHANGED ITEMS**

**SIGNAL PW BOARD CIRCUIT DIAGRAM (Page 2-7~2-8)**

**SIGNAL PW BOARD PARTS LIST (Page 23~24)**

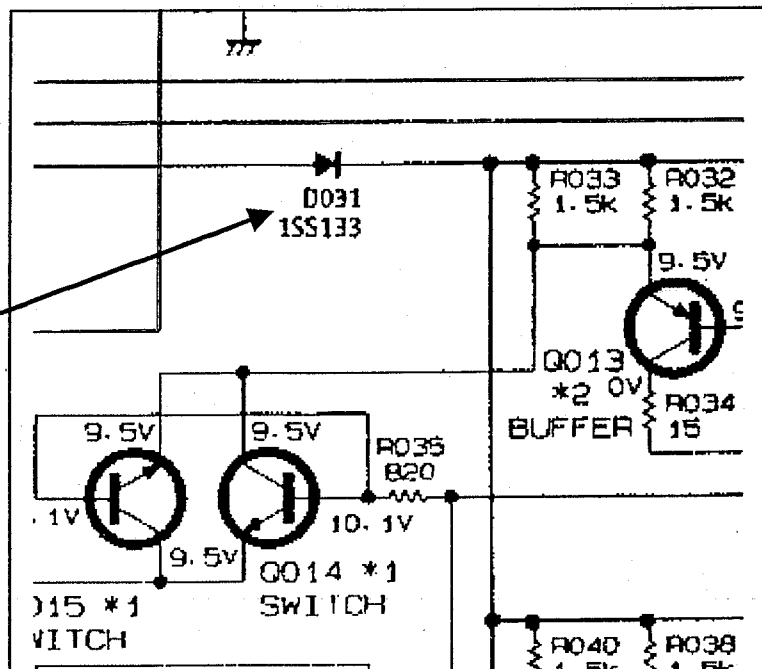
⚠	SYMBOL No.	PARTS No.		PARTS NAME	DESCRIPTION
		PREVIOUS	NEW		
⚠		FX-1089A	<b>FX-1089B</b>	SIGNAL PWB A'SSY	
	D031 (D1031)	1SS133-T2	1SS353-X	SI. DIODE	
	R875 (R1875)	----	QRSA08J-473YL	CH MG RESISTOR	47KΩ
	R876 (R1876)	----	QRSA08J-104YL	CH MG RESISTOR	100KΩ
	R877 (R1877)	----	QRSA08J-102YL	CH MG RESISTOR	1KΩ
	C823 (C1823)	----	NCT03CH-102AY	CHIP CAPACITOR	0.001μF 50V

## SIGNAL PW BOARD CIRCUIT DIAGRAM(Page 2-8)

PREVIOUS  
(FX-1089A)  
1SS133-T2



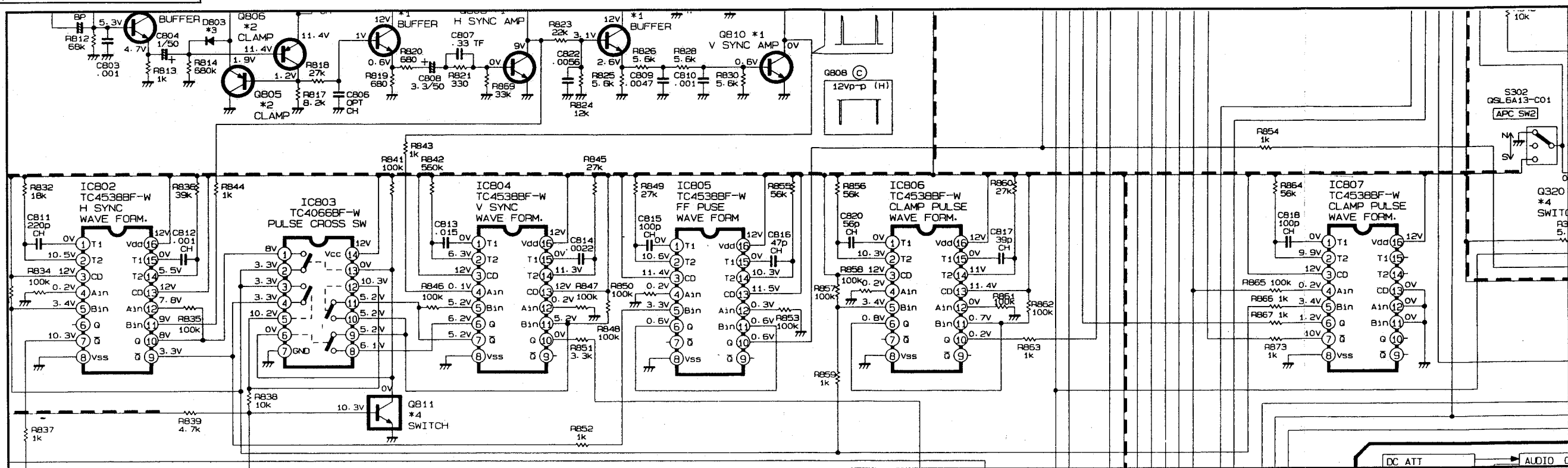
NEW  
(FX-1089B)  
1SS353-X





SIGNAL PW BOARD CIRCUIT DIAGRAM(PAGE 2-7~2-8)

PREVIOUS (FX-1089A)



NEW (FX-1089B)

